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August 20, 2021

BY E-MAIL

Avi Perry, Esq.
Elise Bernanke, Esq.
John Scanlon, Esq.
Scott Armstrong, Esq.
United States Department of Justice
Criminal Division, Fraud Section
1400 New York Avenue, NW
Washington, DC 20530

RE: *United States v. Smith, et al.*, No. 19 CR 669 (EEC) (N.D. Ill.)

Counsel:

Defendant Gregg Smith submits this letter, under Federal Rule of Criminal Procedure 16(b)(1)(C)(i), to provide a summary of the testimony that Professor Chester Spatt, Professor Daniel Fischel, Professor Ciamac Moallemi, and Mr. Raymond Keenan may provide at trial if a defense case is presented.

We reserve the right to supplement and amend these disclosures for any appropriate reason, including, without limitation, the disclosure of additional experts by the government, changes or additions to the expected testimony described in the government's expert witness disclosures, material departures from the government's expert witness disclosures during any expert witness's trial testimony, or the receipt of new evidence from the government or third parties prior to or during trial.

Chester Spatt

Background. Chester Spatt is the Pamela R. and Kenneth B. Dunn Professor of Finance at Carnegie Mellon University's Tepper School of Business, a position that he has held since 2008. He also has held various teaching positions in economics and finance at Carnegie Mellon since 1979. In addition, Professor Spatt has held visiting professorships or residential appointments at other academic institutions, including Princeton University and Massachusetts Institute of Technology.

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In addition, Professor Spatt served as the Chief Economist and Director at the Office of Economic Analysis for the U.S. Securities and Exchange Commission from 2004 to 2007, as a Visiting Scholar at the Federal Reserve Bank of New York in Fall 2010, and, from 2014 to 2017, as a member of the Advisory Committee to the Office of Financial Research for the U.S. Department of the Treasury. He is also a former member of the SEC Equity Market Structure Advisory Committee, the Federal Reserve Bank's Model Validation Council, and the NASDAQ Economic Advisory Board, of which he was chair in 2002. He is currently a Research Associate at the National Bureau of Economic Research, a member of the Systemic Risk Council, and a member of the Financial Economists Roundtable.

Professor Spatt's research concerns the application of economics and econometrics in analyzing the functioning and regulation of financial markets. He has published approximately 60 articles in leading academic journals and has served as an editor for several such journals, including the *Review of Financial Studies*, for which he was a member of the Founding Committee and served as the second Executive Editor. He has also been the recipient of approximately 25 grants and awards. Professor Spatt's curriculum vitae, which contains a list of his publications, grants, and awards, is attached hereto as **Appendix A**.

Professor Spatt has testified as an expert witness in other federal court proceedings. His prior experience as a testifying expert is detailed in **Appendix B**.¹ In addition to his testimony in judicial proceedings, Professor Spatt has given testimony in administrative matters and before Congress.

Expected Testimony & Opinions. Professor Spatt is expected to provide expert opinions on Smith's role as a manual trader and market maker within the spot and futures markets for precious metals. In forming these opinions, Professor Spatt will rely on his analysis of electronic trading in financial markets, relevant trading data, and relevant economic literature, as well as his prior education, experience, and academic research on modern economic markets.

Professor Spatt is expected to testify that certain features of Smith's trading, including his use of scaled orders and his simultaneous placement of orders to buy ("bids") and orders to sell ("offers" or "asks") precious metals futures contracts, are consistent with Smith's former responsibilities and incentives as a market maker for transactions in gold and other precious metals. As Professor Spatt is expected to explain, competitive pressures and exchange rules contemplate that traders will provide two-way price quotes to interested buyers and sellers; one rational way to maximize the accuracy of such quotes is by "scaling"—i.e., placing limit orders for futures contracts at varying price levels to identify and access supply or demand that is not already expressed in the form of resting limit orders (an objective sometimes referred to as "price discovery"). Additionally, Professor Spatt is expected to testify that scaling is also a rational

¹ In addition to the testimony listed in Appendix B, Professor Spatt testified in the mid-1990s as an expert witness in a wrongful termination action, where his testimony involved the valuation of stock options issued by Merck & Co., Inc., for the purpose of calculating damages. Following a good-faith inquiry, Professor Spatt and counsel for Mr. Smith are unable to identify the case caption and docket number for this action but can confirm that it was heard in the United States District Court for the Western District of Pennsylvania.

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method of hedging the risks and capturing the benefits associated with multilevel price movements.

Professor Spatt is also expected to testify about high-frequency algorithmic traders' roles in and effects on these markets. Professor Spatt is likewise expected to testify that, due largely to rapid changes in market conditions, the vast majority of limit orders placed in modern electronic markets (including on COMEX) are canceled before execution, and a substantial percentage of those cancellations occur within five seconds after an order is placed. Professor Spatt is also expected to testify that limit orders placed on COMEX are not required to remain open for any minimum period of time.

Professor Spatt is expected to explain that these observed results are consistent with economic theory. This is because, in a trading environment characterized by high volatility and rapid price movement, frequent and repeated cancellation and replacement of orders is a rational strategy for minimizing adverse-selection risk—i.e., the risk of loss due to changes in market conditions between the time when an order is placed and the time when it is executed. Professor Spatt is likewise expected to testify that the “fill or kill” and “immediate or cancel” (also called “fill and kill”) order types offered in many electronic marketplaces, including those on which Smith traded, are offered and used because they entail no risk of adverse selection.

Professor Spatt is also expected to testify that many algorithmic traders employ a strategy—sometimes referred to as “penny-jumping”—designed to minimize losses by placing orders one price level “better” (i.e., closer to the prevailing market price) than a resting visible order. This strategy creates adverse-selection risk for a trader whose resting order is “jumped,” and such a trader could rationally respond to that risk by canceling his resting order.

Professor Spatt is expected to testify that, because disclosure of a trader’s preferences and strategies places that trader at a disadvantage relative to other market participants, traders take steps to conceal those preferences and strategies. Steps traders may rationally take to conceal their subjective preferences include the use of features offered on some electronic exchanges, including “iceberg” orders, that are specifically designed to facilitate preference concealment. Rational traders may also seek to conceal their subjective preferences by employing mixed strategies—i.e., varying their responses to given conditions even when their subjective preferences do not vary—a phenomenon that is analyzed in game-theoretic literature and observed in a variety of other real-world contexts.

Professor Spatt is expected to testify that the availability of preference-concealment strategies prevents market participants from ascribing subjective desires to activity in the limit-order book. Professor Spatt is expected to further explain that, at the market level, this produces an equilibrium in which market participants treat resting limit orders as open offers to transact, but not as expressions of the preference, desire, or “intent” of the traders who place them.

Professor Spatt may also offer background testimony based on his research and analysis of electronic financial markets. Potential topics for such background testimony include descriptions of the categories of market participants who use financial markets; the various order types available to those market participants; reasons why market participants place visible limit orders (as opposed to orders of another type), including to attract “passive” or “reactive”

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counterparties; and circumstances under which market participants, having placed such orders, withdraw them before they are executed. Specifically, Professor Spatt may testify that market participants who place limit orders rarely plan to leave their orders open until they execute; rather, many rational traders place orders intending to cancel them on the condition that they are not executed within a limited amount of time or in the event of a material change in market conditions. In addition, many traders strategically vary the conditions under which they will cancel their limit orders to avoid revealing their subjective preferences to other market participants. Professor Spatt is therefore expected to testify that, in his opinion, the “intent” of a trader at the moment the trader places an order cannot be reliably inferred from the fact that the order is canceled nor from the speed with which the cancellation occurs. This is especially true in modern electronic markets, where resting orders can be filled within milliseconds of their appearance in the limit-order book.

Finally, Professor Spatt is expected to opine on methodological flaws in certain opinions offered by the government’s economic expert, Professor Kumar Venkataraman, about “patterns” Professor Venkataraman claims to have observed in Smith’s trading activity. Among other things, Professor Spatt may testify that “sequences” or “episodes” of selected and varying lengths are not legitimate units of analysis for the type of constant trading behavior in which traders like Smith engage. Professor Spatt may also testify about the ways in which Professor Venkataraman’s analysis is inconsistent with a basic and universally accepted principle of economic research: the measurement of complete or randomly sampled data against a null hypothesis that is consistent with theoretical assumptions (in this case, that Smith’s orders were not placed with an unconditional intent to cancel before execution) and is only rejected under predetermined statistical criteria.

Daniel Fischel

Background. Daniel Fischel is the Lee and Brena Freeman Professor of Law and Business Emeritus at the University of Chicago Law School. Professor Fischel previously served as Dean of the University of Chicago Law School, Director of the Law and Economics Program at the University of Chicago, and Professor of Law and Business at the University of Chicago Graduate School of Business (by courtesy), the Northwestern University Law School, and the Kellogg School of Management at Northwestern University (by courtesy).

In addition to his academic appointments, Professor Fischel is the President and Chairman of Compass Lexecon, a consulting firm that specializes in the application of economics to legal and regulatory issues. He has served as a consultant or advisor on economic issues to the United States Department of Justice, the United States Securities and Exchange Commission, the National Association of Securities Dealers, the New York Stock Exchange, the Chicago Board of Trade, the Chicago Board Options Exchange, the Chicago Mercantile Exchange, the New York Mercantile Exchange, the United States Department of Labor, the Federal Deposit Insurance Corporation, the Resolution Trust Corporation, the Federal Housing Finance Agency, and the Federal Trade Commission. He is a member of the American Economic Association and the American Finance Association, a former member of the Board of Governors of the Becker Friedman Institute at the University of Chicago, a former Advisor to the Corporate Governance Project at Harvard University, a former member of the Board of Directors of the Center for the

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Study of the Economy and the State at the University of Chicago, and a former Chairman of the American Association of Law Schools' Section on Law and Economics.

Professor Fischel's research concerns the economics of corporate law and financial markets. Professor Fischel has published approximately 50 articles in leading legal and economic journals and is a coauthor, with Judge Frank Easterbrook of the United States Court of Appeals for the Seventh Circuit, of *The Economic Structure of Corporate Law* (published by Harvard University Press). Courts at all levels, including the Supreme Court of the United States, have cited Professor Fischel's scholarship. Professor Fischel's curriculum vitae, which contains a list of his publications and prior testimony, is attached hereto as **Appendix C**.

As detailed in his curriculum vitae, Professor Fischel has testified as an expert witness in many federal and state court proceedings. His prior experience as a testifying expert includes two trials involving allegations of spoofing: *U.S. Commodity Futures Trading Commission v. Oystacher, et al.*, No. 15 CR 9196 (N.D. Ill. 2016), and *United States v. Bases, et al.*, No. 18 CR 48 (JZL) (N.D. Ill. 2021).

Expected Testimony & Opinions. Professor Fischel is generally expected to testify consistent with his opinions in *Bases*. A transcript of his testimony in that case is attached hereto as **Appendix D**. Professor Fischel is expected to compare the characteristics of the Large-Side Orders² and Small-Side Orders in the Smith Episodes with the characteristics of Gregg Smith's trading in other trading sequences. Specifically, we expect that Professor Fischel will testify about trends in Smith's broader trading activity, including:

- The characteristics of the Smith Group Orders that did and did not have a smaller order that was active at the same time on the opposite side of the market.
- The characteristics of the Smith Group Orders that are in the Smith Episodes as compared with the characteristics of the Smith Group Orders that are not in the Smith Episodes.
- The characteristics of smaller orders on the opposite side of the Smith Group Orders that are in the Smith Episodes as compared with the characteristics of the Small-Side Orders that are not in the Smith Episodes.
- Market conditions surrounding the government episodes, including market volatility and the activity of Smith and other market participants before, during, and after the episodes.
- The frequency and speed with which Smith's orders are joined at the same price level or penny-jumped by other traders.

In addition, and based on the foregoing, Professor Fischel is expected to offer opinions about flaws in Professor Venkataraman's analysis. Professor Fischel's opinions about Professor Venkataraman's analysis will also be based on his review of the Superseding Indictment and the

² This and other capitalized terms in this section have the meanings ascribed to them in the expert disclosure for Professor Kumar Venkataraman provided by the government on June 21, 2021.

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government's expert disclosures. Among other things, Professor Fischel is expected to testify that Professor Venkataraman draws unsound inferences from the "patterns" he claims to have observed in Smith's trading activity, because they were observed across a biased and nonrepresentative data sample selected by the government.³ He is also expected to testify about Professor Venkataraman's opinion that "[m]arket participants tend to respond to the arrival of a large fully displayed resting order (or groups of orders that in the aggregate are large) by trading ahead (i.e., in the same direction) of the large order(s)." *See Gov't Expert Disclosures* at 7. Specifically, Professor Fischel is expected to explain that this opinion is inconsistent with Professor Venkataraman's published writings, which note that many market participants wait for other traders to reveal their trading interest in the form of visible limit orders, while others withdraw from the market temporarily in response to such orders. *See generally* Henrik Bessembinder, Marios Panayides, and Kumar Venkataraman, "Hidden Liquidity: An Analysis of Order Exposure Strategies in Electronic Markets," 94 *J. Fin. Econ.* 361 (2009).

Professor Fischel may also provide expert opinions on Smith's trading consistent with those disclosed above for Professor Spatt. In forming these opinions, Professor Fischel will rely on relevant data and economic literature, as well as his prior education, experience, and academic research.

Ciamac Moallemi

Background. Professor Ciamac Moallemi is the William von Mueffling Professor of Business at the Columbia University Graduate School of Business, where his teaching and research are conducted primarily within the school's Decision, Risk, and Operations Division. Professor Moallemi's previous positions at the Columbia University Graduate School of Business include Associate Professor of Business (with tenure), the Barbara and Meyer Feldberg Associate Professor of Business, Associate Professor, and Instructor.

In addition to his academic appointments, Professor Moallemi has served since 2014 as a Managing Member of Bourbaki LLC, a quantitative trading firm. His prior work experience also includes the design of mathematical and computational models for use in financial markets, as well as the development of algorithms for scientific data analysis.

Professor Moallemi's research focuses in part on market microstructure and quantitative and algorithmic trading. Professor Moallemi's curriculum vitae, which contains a list of his publications, is attached hereto as **Appendix E**.

Professor Moallemi has not testified as an expert witness in other proceedings.

Expected Testimony and Opinions. Professor Moallemi may testify, in the alternative to Professor Fischel, about relevant observations concerning the comparison data from the Smith Episodes with Smith's other trading activity. Professor Moallemi may also testify, in the

³ We reserve the right to supplement or amend these disclosed opinions to the extent that the government provides additional information regarding data analyzed by Professor Venkataraman, which defense counsel have requested in letters dated July 9, 2021, and August 16, 2021, and which the government has not yet provided.

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alternative to Professor Spatt, about the roles and incentives of various types of market participants, with specific attention to regulatory and competitive constraints and the conditions under which they cancel limit orders. In the event that Professor Moallemi testifies on these topics, his testimony is expected to be consistent with the opinions disclosed above for Professors Fischel and/or Spatt.⁴

In addition, Professor Moallemi is expected to testify about the placement of trades in the spot and futures markets in order to hedge against risk associated with other commodity derivatives, including but not limited to barrier options. Professor Moallemi is also expected to testify about algorithmic trading, execution speeds, and latency in modern electronic trading platforms, as well as the effects of those phenomena on manual traders.

Raymond Keenan

Background. Raymond Keenan is a former trader specializing in precious metals and precious metals derivative products. Most recently, he was the Global Head of Precious Metals Trading at Prudential Financial. He also managed the metals trading business at Dresdner Bank and Deutsche Bank Sharps Pixley, Inc. In these roles, Mr. Keenan served a global client base of central banks and industrial metals consumers, created and managed metals products, and implemented proprietary trading strategies. In addition to his employment at various financial institutions, Mr. Keenan served as an elected Governor on the Board of Commodity Exchange Inc., which developed and operated the online COMEX platform prior to its merger with the New York Mercantile Exchange. Mr. Keenan was also a member of the committee responsible for that merger.

Mr. Keenan has testified as an expert witness in other federal court proceedings, including a prior trial involving allegations of spoofing. *See United States v. Flotron*, No. 17 CR 220 (D. Conn. 2018). Mr. Keenan's curriculum vitae is attached hereto as **Appendix F**.

Expected Testimony & Opinions. Mr. Keenan is expected to provide testimony regarding the responsibilities of, and strategies used by, precious metals traders like Defendant Gregg Smith. Specifically, Mr. Keenan is expected to testify that certain phenomena observed in Smith's trading activity, including the simultaneous placement of limit orders to buy ("bids") and sell ("offers" or "asks") precious metals futures contracts, the placement of limit orders at multiple price levels (often referred to as "scaling"), and the rapid cancellation and replacement of limit orders, are consistent with rational strategies employed by market makers like Smith and, therefore, these features of Smith's trading are consistent with an intent to trade and inconsistent with an intent to cancel. In forming these opinions, Mr. Keenan will rely on his extensive experience trading the products at issue, his experience supervising traders, and his review of materials produced in this case, including Smith trading data extracted from the "episodes" the government intends to present at trial, as well as other Smith trade data. To the extent that Smith sent or received electronic

⁴ Despite the partial overlap in the opinions of Professors Spatt, Fischel, and Moallemi as disclosed herein, we recognize the need to avoid cumulative testimony. Accordingly, on each topic described in this disclosure for each of those witnesses, we expect to elicit testimony from only one of those three witnesses. We further expect to clarify for the government in advance of any defense case which witnesses may be called.

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communications that are contemporaneous with or otherwise appear to correspond to particular trading episodes, Mr. Keenan may also rely on those communications in forming his opinions.

Mr. Keenan is expected to testify about the responsibilities and incentives of market makers like Smith, including risk management, client order hedging, profitability, and applicable exchange rules. Mr. Keenan is also expected to explain the concept of execution risk—i.e., the likelihood that an open, marketable order will be executed—and the effect of order size and placement on the likelihood and speed of execution. He may also explain his understanding of the impact other market conditions, including volatility and trading volume, exert on execution risk.

Mr. Keenan may opine on technical aspects of commodity futures trading in markets operated by CME Group, including:

- types of orders allowed by CME Group exchanges, including market orders, limit orders, “iceberg” orders, “fill-or-kill” and “immediate-or-cancel” orders, and stop-loss orders);
- the speed and frequency with which various types of orders are placed and canceled;
- the mechanics and design of the COMEX order book;
- relevant phenomena in electronic markets for precious metals futures, including the prevalence of algorithmic traders, market sweeps, and “penny-jumping” or “piggy-backing” and their impacts on manual traders;
- the information communicated to other traders in the market through the placement of limit orders on CME Group exchanges;
- the inferences commonly drawn by manual traders from order activity and book depth;
- common reactions to changes in market conditions, especially increases in volatility;
- reasons why a reasonable trader may place or cancel orders; and
- placement and cancellation of orders for price discovery, obtaining information about directionality and depth (or lack thereof) of markets at that moment, determining whether institutional investors as opposed to algorithmic/opportunistic traders were the counterparties, and engaging with and trying to capture market movements.

Mr. Keenan may opine on the various factors that, in his experience, can cause fluctuations in the price of commodity futures products. He may also opine on ways in which market participants attempt to gather real-time information about these factors, which they use to make future trading decisions.

Finally, Mr. Keenan may opine on traders’ general understandings of common phrases that appear in certain trial exhibits, including “bid it up,” “offer it down,” “working,” “jobbing,” and “two-way business.”

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Sincerely,

/s/ Jonathan D. Cogan

Jonathan D. Cogan
Sean S. Buckley
Matthew I. Menchel
Leanne A. Bortner
Christopher S. Cogburn

Kobre & Kim LLP
Counsel for Defendant Gregg Smith

Encls.

cc: All counsel of record for Defendants Jeffrey Ruffo, Michael Nowak, and Christopher Jordan

APPENDIX A

April 2021

VITA

Name: Chester Spatt

Current Position

Pamela R. and Kenneth B. Dunn Professor of Finance (2008–
Tepper School of Business
Carnegie Mellon University
Phone: [REDACTED]
Email: [REDACTED]

Earlier Positions

Golub Distinguished Visiting Professor, Sloan School MIT and Distinguished Senior Fellow, Golub Center, MIT (2017-2019)

Chief Economist and Director, Office of Economic Analysis, U.S. Securities and Exchange Commission (2004-2007)

Mellon Bank Professor of Finance (1996–2008)
Professor of Economics and Finance (1987–1996)
Associate Professor of Economics and Finance (1984–1986)
Assistant Professor of Economics (1979–1984)
Carnegie Mellon University

Visiting Scholar (Fall 2010)
Federal Reserve Bank of New York

Scholar in Residence (Fall 2008)
Columbia Law School

Visiting Professor (May 1996)
Toulouse University

Leslie Wong Distinguished (Visiting) Professor of Finance (May 1986)
University of British Columbia

Visiting Assistant Professor of Economics (Spring 1984)
Princeton University

Education

University of Pennsylvania (1975-1979)
Ph.D. degree in Economics, December 1979.
A.M. degree in Economics, December 1976.
Honors: Dissertation awarded the 1980 William Polk Carey Prize of the Department of Economics.
Lawrence Robbins Prize for the top performance among first year graduate students.
University Fellowship, 1978–1979.

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Education Continued

Center for the Study of Organizational Innovation
Research Fellowship, 1978–79.
Economic Research Unit Fellowship, 1975–78.
Dissertation: "Three Essays in the Economics of Finance and Organization,"
Supervisor: Professor Stephen A. Ross (Yale University).

Yale University (1977-1978)
Visiting student, Department of Economics.

Princeton University (1971-1975)
A.B. degree in Economics, June 1975.
Honors: Magna cum laude graduate

Research Interests

Taxation and Asset Allocation
Economics of Financial Market Regulation
Market Microstructure
Fixed-Income, Commodity and Options Valuation and Hedging

Teaching Experience

Ph.D.

Markets and Intermediaries
Information and Agency Problems in Financial Economics
Portfolio and Equilibrium Pricing Theory in Finance
Topics in Industrial Organization
Contract Theory
Valuation of Interest Rate Dependent Claims

Masters

Ethics and Regulation (Finance)
Financial Regulation
Real Estate
Taxation and Financial Strategy
Market Microstructure
Fixed-Income Investing
Investment Analysis
Corporation Finance
Strategic Rivalry
Financial Contracts/Investment Banking

Undergraduate

Financial Regulation in the Digital Age
Intermediate Macroeconomics
Industrial Organization
Intermediate Microeconomics

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Teaching Experience Continued

Executive
Dynamic Wealth Planning
Capital Markets
Advanced Training Program in Economics
Program in Competitive Strategy
Program for Executives
Corporate, Municipal and Mortgage Debt

Grants

Principal Investigator, Wharton-TIAA Grant, “Asset Allocation, Annuitization and Retirement Investing,”
June 2015–September 2016.

Principal Investor of Sloan Foundation Grant, “Credit Ratings and Credit Rating Agencies: Developing a Research Network on Markets for Financial Information,” August 1, 2011–December 31, 2016.

Principal Investigator of Sloan Foundation Grant, “The Industrial Organization of Credit Rating Agencies,”
April 1, 2009–April 30, 2011.

Co-Principal Investigator of National Science Foundation Grant SES-9905543 on “Cross-Commodity Equilibrium Pricing: Theoretical Implications and Empirical Tests of Forward and Option Prices,”
July 1, 1999–June 30, 2002.

Co-Principal Investigator of National Science Foundation Grant IRI 8605282 on “The Effect of Information, Transactions Costs and Uncertainty on Debt Contracts and Pricing,”
October 1, 1986–September 30, 1989.

Principal Investigator of National Science Foundation Grant IST 8408966 on “Information and Uncertainty in Financial Markets,” October 15, 1984–March 31, 1987.

Principal Investigator of National Science Foundation Grant IST 8208575 on “Models of Information in Industrial Organization,” October 1, 1982–March 31, 1985.

Principal Investigator of National Science Foundation Grant SES 8015086 on “The Economics of Price Discrimination,” October 15, 1980–March 31, 1983.

Co-Principal Investigator of Teachers Insurance Annuity Association – College Retirement Equity Fund Grant on “Taxes, Estate Planning and Financial Theory: New Insights and Perspectives,” 2002–2003.

Co-Principal Investigator of Teachers Insurance Annuity Association – College Retirement Equity Fund Grant on “Diversification and Capital Gains Taxes with Multiple Risky Assets,” 2001–2002.

Co-Principal Investigator of Teachers Insurance Annuity Association – College Retirement Equity Fund Grant on “Optimal Asset Location and Allocation with Taxable and Tax-Deferred Investing,” 2000–2001.

Co-Principal Investigator of Teachers Insurance Annuity Association - College Retirement Equity Fund Grant on “Optimal Portfolio Choice and Consumption with Capital Gains Taxes,” 1999–2000.

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Grants Continued

Co-Principal Investigator of Institute for Quantitative Research in Finance Grant on "Taxes, Estate Planning, and Financial Theory: New Insights and Perspectives," 2003–2006.

Co-Principal Investigator of Institute for Quantitative Research in Finance Grant on "Equilibrium Returns and Portfolio Choices Under Asymmetric Information," 1999–2003.

Co-Principal Investigator of Institute for Quantitative Research in Finance Grant on "Equilibrium Forward and Option Pricing for Commodities," 1997–1999.

Project Coordinator of North Atlantic Treaty Organization Collaborative Research Grants on "Price Formation on the Paris Bourse: Empirical and Theoretic Analysis," 1994–1996, 1996–1998 and 1997–1999.

Co-Principal Investigator of Institute for Quantitative Research in Finance Grant on "An Empirical Analysis of the Limit Order Book and the Order Flow in the Paris Bourse," 1992–1994.

Co-Principal Investigator of Carnegie Bosch Institute Grant on "The Organization of Foreign Exchange Rate Hedging," 1991–1993.

Co-Principal Investigator of Herbert V. Prochnow Educational Foundation Award on "Implications of Mortgage Refinancing for Bank Management," 1987.

Principal Investigator of Subcommittee on Monetary Research of the Social Science Research Council Award on "Analysis of Credit Markets," April 1, 1983–March 31, 1984.

Awards

Recipient (with R. Dammon) of American Association of Individual Investors Award at the 1990 Western Finance Association meeting for "An Option Theoretic Approach to the Valuation of Dividend Reinvestment and Voluntary Purchase Plans."

Recipient (with B. Routledge and D. Seppi) of First Prize-Roger Murray Award for "Equilibrium Forward Curves for Commodities," as Best Paper Presented at the 1998 meetings of the Institute for Quantitative Research in Finance.

Recipient (with R. Dammon and H. Zhang) of Runnerup Award for Barclays Global Investors/Michael Brennan Best Paper Prize for Volume 14 (2001) of the Review of Financial Studies for "Optimal Consumption and Investment with Capital Gains Taxes."

Recipient (with R. Dammon and H. Zhang) for "Optimal Asset Location and Allocation with Taxable and Tax-Deferred Investing," of the 2004 Paul A. Samuelson Award from TIAA-CREF for "Outstanding Scholarly Writing on Issues Related to Lifelong Financial Security."

http://www.tiaa-crefinstitute.org/ucm/groups/content/@ap_ucm_p_tcp_docs/documents/document/tiaa02029894.pdf

Chester Spatt

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Professional Activities

Research Associate, National Bureau of Economic Research, 2008– .

Senior Economic Advisor, Kalorama Partners, 2008– .

Member, Office of Financial Research Advisory Committee, 2014–2017.

Member, SEC Equity Market Structure Advisory Committee, 2015–2018.

Member, Federal Reserve Bank’s Model Validation Council, 2012–2015.

Member, Systemic Risk Council, 2012– .

Member, Cleveland Federal Reserve’s Academic Advisory Council, 2012

Member, Shadow Financial Regulatory Committee, 2007–2015.

Member, Financial Economists Roundtable, 2006– .

Fellow, TIAA-CREF Institute, 2007– .

Fellow, Columbia Program on “Law and Economics of Capital Markets,” 2008– .

Executive Editor, Review of Financial Studies, 1990–1993.

Editor, Review of Financial Studies, 1987–1990.

Co-Editor, Foundations and Trends in Finance, now publishers, 2018--

Advisory Editor, Journal of Financial Markets, 2003– .

Associate Editor, Journal of Real Estate Finance and Economics, 1987–1998.

Associate Editor, Real Estate Economics (formerly Journal of the American Real Estate and Urban Economics Association), 1995– .

Associate Editor, Journal of Financial and Quantitative Analysis, 1999– .

Associate Editor, Financial Management, 1999–2005.

Member of Advisory Board for Journal of Financial Abstracts, Real Estate Section, 1996– .

Member of Economic Advisory Board, NASDAQ, 2000-2002 (Chair: 2002).

President, Society for Financial Studies, 1993–1996.

Member of Founding Committee, Society for Financial Studies.

Distinguished Speaker, Western Finance Association, June 2009

Chester Spatt

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Professional Activities Continued

President, Western Finance Association, 1995–1996.

Program Chairman, Western Finance Association, 1995 meetings.

President-elect, Western Finance Association, 1994–1995.

Vice President, Western Finance Association, 1993–1994.

Member of Program Committee, 1999 American Economic Association meetings.

Member of Program Committee, 1989 Econometric Society Winter meetings.

Member of Program Committee, 1985–91, 1997–1999, 2005–2008, 2010–2015.
Western Finance Association meetings.

Member of Program Committee, European Finance Association meetings.

Member of Program Committee, Utah Winter Finance Association meetings.

Presented papers at major universities and conferences.

Discussant and Chairman at numerous professional conferences (e.g., American Finance Association,
Econometric Society, Western Finance Association).

Referee for American Economic Review, American Real Estate and Urban Economics Association Journal,
Canada Council, Earhart Foundation, Econometrica, Financial Management, Financial Review,
International Economic Review, Journal of Business, Journal of Economic Theory, Journal of
Economics and Business, Journal of Finance, Journal of Financial and Quantitative Analysis, Journal of
Financial Economics, Journal of Financial Intermediation, Journal of Financial Research, Journal of
Industrial Economics, Journal of Political Economy, Management Science, Mathematics of Operations
Research, National Science Foundation, Quarterly Journal of Economics, RAND (Bell) Journal of
Economics, Review of Economic Studies, Review of Financial Studies, Sloan Management Review,
and University of Pennsylvania Law Review.

Publications

“Big Data in Finance,” (forthcoming July 2021), *Review of Financial Studies* (with I. Goldstein and M. Ye).
<https://academic.oup.com/rfs/advance-article/doi/10.1093/rfs/hhab038/6210658?guestAccessKey=eb84ce0c-fdbd-49fe-ad9c-686d73aa683e>

“Proxy Advisory Firms, Governance, Market Failure, and Regulation,” March 2021, *Review of Corporate Finance Studies*, 10, 136–157.
<https://academic.oup.com/rcfs/article-abstract/10/1/136/6050869?redirectedFrom=fulltext>

“Conflicts of Interest in Asset Management and Advising,” 2020, *Annual Review of Financial Economics*, 12, 217–235.

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Publications Continued

“A Tale of Two Crises: The 2008 Mortgage Meltdown and the 2020 COVID-19 Crisis,” December 2020, *Review of Asset Pricing Studies*, 10, 759-790.

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“Economic Analysis and Cost-Benefit Analysis: Substitutes or Complements?” presented as a Luncheon Address at the meeting of the Society for Government Economists and the National Economists Club on March 15, 2007.
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Keynote and Distinguished Speaker Addresses and Policy Discussions Continued

“The Economics of FIN 48: Accounting for Uncertainty in Income Taxes” presented at the Global Knowledge Congress Teleconference on March 8, 2007.

<http://www.sec.gov/news/speech/2007/spch030807css.htm>

“Penalties and Sanctions for Securities Fraud” presented at the American Economic Association meetings on January 6, 2007.

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“Regulatory Issues and Economic Principles,” presented at the Sixth Maryland Finance Symposium.

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“The Value of Off-Exchange Data” March 2021, (with T. Ernst).

“Creating Controversy in Proxy Voting Advice” in preparation, April 2021, (with A. Malenko, N. Malenko).

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“Is Equity Market Exchange Structure Anti-Competitive?” December 2020.

“What should be the Regulatory Boundary between the SEC and the Federal Reserve?” unpublished manuscript.

“The Role of the Employer Default Allocation in Defined-Contribution Retirement Plan Design,” October 2018, TIAA Institute Research Dialogue No. 149.

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“A Solution to the Palm-3Com Spin-off Puzzles,” February 2015 (with M. Cherkes and C. Jones).

“Retirement Investing: Analyzing the ‘Roth’ Conversion and Re-characterization Options,” revised November 2013 (with Robert Dammon and Harold Zhang).

“Measurement and Policy Formulation,” revised October 2015.

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“The “Spark” Spread: Cross-Commodity Equilibrium Restrictions and Electricity,” presented at the American Economic Association meetings, revised May 2001 (with B. Routledge and D. Seppi).

“The Theory of Endowment Management and Dynamic Portfolio Theory,” December 1999, working paper.

“Market Rules and Order Strategies in the Preopening, Opening and Trading Day,” presented at the European Summer Symposium in Financial Markets at Gerzensee, July 1998.

“Do Heterogeneous Basis Values Affect Equilibrium Asset Prices?,” unpublished manuscript, March 1995 (with R. Dammon).

“Asymmetric Information and the Smoothing of Dividends,” presented at the Conference on Strategic Issues in Financial Contracting at Indiana University, August 1987 (with P. Kumar).

“Does It Pay to Maintain a Reputation? Quality Incentives in Financial Markets,” unpublished manuscript, revised December 1985 (with P. Dybvig).

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“Agency and the Market for Mutual Fund Managers: The Principle of Preference Similarity,” presented at the American Finance Association meetings, December 1983 (with P. Dybvig).

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APPENDIX B

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Deposition Testimony

- *In re Initial Public Offering Securities Litigation*, Master File No. 21 MC 92 (SAS) (S.D.N.Y. 2009), on behalf of Defendant Goldman, Sachs & Co.
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Testimony in Other Proceedings

- *In the Matter of Mohammed Riad and Kevin Timothy Swanson*, SEC Administrative Proceeding File No. 3-15141 (2013), on behalf of Respondents Mohammed Riad and Kevin Timothy Swanson.

APPENDIX C

DANIEL R. FISCHER

Business Address:

Compass Lexecon



March 2021

PROFESSIONAL EXPERIENCE

Lee and Brenna Freeman Professor of Law and Business, University of Chicago Law School (1/84 – 12/2005, chair awarded in 7/89, emeritus as of 1/1/2006); Dean of Law School (1/99 – 2/01); Visiting Professor of Law, University of Chicago Law School (7/82 - 6/83).

Professor of Law and Business, Northwestern University School of Law (1/1/2006 – 5/2011). Professor, Kellogg School of Management (courtesy appointment, 1/1/2006 – 5/2011).

Jack N. Pritzker Distinguished Visiting Professor of Law, Northwestern University School of Law (6/02-6/03).

Professor of Law and Business, University of Chicago Graduate School of Business (7/87 - 6/90).

Director, Law and Economics Program, University of Chicago (1/84 - 6/91).

Assistant Professor of Law, Northwestern University School of Law (6/80 - 6/81); Associate Professor of Law, Northwestern University School of Law (6/81 - 6/82); promoted to full professor in 6/82.

Attorney with Levy and Erens, Chicago, Illinois (7/79 - 6/80).

Law Clerk for Associate Justice Potter Stewart of the United States Supreme Court (1978 - 1979).

Law Clerk for Judge Thomas E. Fairchild, Chief Judge of the Seventh Circuit Court of Appeals (1977 - 1978).

CONSULTING EXPERIENCE

President and Chairman, Compass Lexecon (formerly Lexecon).

AREAS OF SPECIALIZATION

Securities and Financial Markets, Valuation and Financial Analysis, Bankruptcy and Financial Distress Litigation, ERISA Litigation, Class Certification, Damages, Corporate Governance.

PUBLICATIONS

Payback: The Conspiracy to Destroy Michael Milken and His Financial Revolution, Harper Business (1995).

The Economic Structure of Corporate Law, Harvard University Press (1991) (with Frank H. Easterbrook).

ARTICLES

The Use of Trading Models to Estimate Aggregate Damages in Securities Fraud Litigation: An Update, Briefly... Perspectives on Legislation, Regulation, and Litigation, Vol. 10, No. 3 (National Legal Center for the Public Interest, 2006) (with David J. Ross and Michael A. Keable).

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Should One Agency Regulate Financial Markets, in Black Monday and the Future of Financial Markets (R. Kormendi, R. Kamphuis & J. W. H. Watson, ed.) (Dow Jones-Irwin Inc., 1988).

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The Role of Liability Rules and the Derivative Suit in Corporate Law: A Theoretical and Empirical Analysis, 71 Corn. L. Rev. 261 (1986) (with Michael Bradley).

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EDUCATION

University of Chicago Law School, Chicago, Illinois; J.D. 1977, cum laude; Order of the Coif; Comment Editor, Vol. 44, University of Chicago Law Review; Approximately top 1% of the Class. Awarded Casper Platt Award for best paper written by a student of the University of Chicago Law School; awarded Jerome N. Frank Prize for excellence in legal writing while a member of the University of Chicago Law Review, 1975 - 1977. Studied law and economics with Richard Posner and other members of the faculty.

Brown University, Providence, Rhode Island; M.A. 1974 in American History.

Cornell University, Ithaca, New York; major-American History; minor-Economics; B.A. 1972

TESTIMONY

Testimony of Daniel R. Fischel United States v. Bases, In the United States District Court for The Northern District of Illinois, Case No. 1:18-CR-00048, (July 29 and 30, 2021).

Deposition of Daniel R. Fischel In Re: Jeld-Wen Holdings, Inc. Securities Litigation, In the United States District Court for The Eastern District of Virginia, Richmond Division, Civil Action No. 3:20-cv-00112-JAG, (February 26, 2021).

Testimony of Daniel R. Fischel In Re: The Pacific Gas and Electric Company Administration of Stress Test Methodology Developed Pursuant to Public Utilities Code Section 451.2(b) and (2) Determination That \$7.5 Billion of 2017 Catastrophic Wildfire Costs and Expenses Are Stress Test Costs That May Be Financed Through Issuance of Recovery Bonds Pursuant to Section 451.2(c) and Section 850 et Seq.(U39E), Before the Public Utilities Commission of the State of California, Application No. 20-04-023, (December 15, 2020).

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Deposition of Daniel R. Fischel In Re: SH 130 Concession Company, LLC, Zachry Toll Road – 56 LP Cintra Texas 56 LLC et al. vs. Central Texas Highway Constructors, LLC, et al., In the United States Bankruptcy Court, Western District of Texas, Austin Division, Case No. 16-10262-TMD, Adversary No. 18-01030, (November 5, 2020).

Deposition of Daniel R. Fischel In Re: Ahmed D. Hussein versus Sheldon Razin, Steven Plochocki, Quality Systems, Inc., et al., In the Superior Court of the State of California, County of Orange, Case No. 302013-00679600 CUNPCJC, (October 22, 2020).

Deposition of Daniel R. Fischel In Re: Deutsche Bank National Trust Company, Solely in its Capacity as Trustee of the Harborview Mortgage Loan Trust Mortgage Loan Pass-Through Certificates, Series 2006-9, In the Supreme Court of the State of New York County of New York, Index No. 654208/2018 (September 25, 2020).

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Testimony of Daniel R. Fischel In Re: AB Stable VIII LLC vs. Maps Hotels and Resorts One LLC, et al., In the Court of Chancery of the State of Delaware, C. A. No. 2020-0310-JTL (August 28, 2020).

Deposition of Daniel R. Fischel In Re: AB Stable VIII LLC vs. Maps Hotels and Resorts One LLC, et al., In the Court of Chancery of the State of Delaware, Case No. 2020-0130-JTL (August 14, 2020).

Deposition of Daniel R. Fischel In Re: Willis Towers Watson PLC Proxy Litigation, In the United States District Court for the Eastern District of Virginia, Alexandria Division, Master File No. 1:17-cv-1338-AJT-JFA (August 12, 2020).

Deposition of Daniel R. Fischel In Re: Forescout Technologies, Inc. et al. vs. Ferrari Group Holdings, LP, and Ferrari Merger Sub, Inc., et al., In the Court of Chancery of the State of Delaware, Civil Action No. 2020-0385-SG (July 13, 2020).

Deposition of Daniel R. Fischel In Re: Brigade Leveraged Capital Structures Fund Ltd. et al. vs. Kindred Healthcare, Inc., et al., In the Circuit Court of Chancery of the State of Delaware, Case No. 2018 0165 (February 5, 2020).

Testimony of Daniel R. Fischel In Re: Gannaway Entertainment, Inc. et al vs. Frankly Inc. et al., In the United States District Court, Northern District of California, San Francisco Division, Case No. 3:17-cv-04169-RS (December 17, 2019).

Deposition of Daniel R. Fischel In Re: The Official Committee of Unsecured Creditors of Allied Systems Holdings, Inc. and its affiliated debtors et al. v. Yucaipa, et al., In the U.S. Bankruptcy Court for the District of Delaware, Bankr., D. Del., Proc. Nos. 13-50530-KBO, 14-50971-KBO (December 16, 2019).

Testimony of Daniel R. Fischel In Re: Nord Anglia Education, Inc., In the Grand Court of The Cayman Islands, Financial Services Division, Cause No. FSD 235 of 2017 (IKJ). (December 6, 9, 10 and 11, 2019).

Deposition of Daniel R. Fischel In Re: Lindie L. Banks and Erica LeBlanc, individually and on behalf of all others similarly situated vs. Northern Trust Corporation and Northern Trust Company, In the United States District Court, Central District of California, Case No. 2: 16-cv-09141-JFK (JCx) (November 22, 2019).

Deposition of Daniel R. Fischel In Re: Tesla Motors, Inc. Stockholder Litigation, In the Court of Chancery of the State of Delaware, C.A. No. 12711-VCS (November 19, 2019).

Deposition of Daniel R. Fischel In Re: Melina N. Jacobs, On Behalf of Herself and All Others Similarly Situated vs. Verizon Communications, Inc., et al., In the United States District Court for the Southern District of New York, Civil Action No. 1:16-cv-01082 (August 28, 2019).

Deposition of Daniel R. Fischel In Re: American Realty Capital Properties, Inc. Litigation, In the United States District Court, Southern District of New York, Civil Action No. 1:15-mc-00040-AKH Class Action (July 25, 2019).

Deposition of Daniel R. Fischel In Re: Rajesh M. Shah, et al vs. Zimmer Biomet Holdings, Inc., et al., In the United States District Court, Northern District of Indiana, South Bend Division, Case No. 3:16-cv-815-PPS-MGG (May 17, 2019).

Testimony of Daniel R. Fischel In Re: Colonial Chevrolet Co., Inc., et al., Alley's of Kingsport, Inc., et al., and Union Dodge, Inc., et al. vs. The United States (Nos. 10-647C, 11-100C, and 12-900L – Consolidated), In the United States Court of Federal Claims (May 8, 2019).

Testimony of Daniel R. Fischel In Re: Anthem, Inc. vs. Cigna Corporation, In the Court of Chancery of the State of Delaware, C.A. No. 2017-0114-JTL (March 8, 2019).

Deposition of Daniel R. Fischel In Re: Nine West holdings, Inc., et al., Debtors, United States Bankruptcy Court, Southern District of New York, Chapter 11 Case No. 18-10947 (SCC) (January 16, 2019).

Deposition of Daniel R. Fischel In Re: Sandisk LLC Securities Litigation, United States District Court, Northern District of California, San Francisco Division, Case No. 3:15-cv-01455-VC (November 16, 2018).

Deposition of Daniel R. Fischel In Re: Colonial Chevrolet Co., Inc., Alley's of Kingsport, Inc. and Union Dodge, Inc., et al vs. The United States, In the United States Court of Federal Claims, Nos. 10-647C, 11-100C and 12-900L (Consolidated) (November 15, 2018).

Testimony of Daniel R. Fischel In Re: United States of America, et al., vs. J-M Manufacturing Co., Inc., United States District Court, Central District of California – Western Division, No. CV 6-55 GW (November 5, 2018).

Deposition of Daniel R. Fischel In Re: Appraisal of Air Methods Corp., In the Court of Chancery of the State of Delaware, C.A. No.: 2017-0317-JRS (September 27 and 28, 2018).

Testimony of Daniel R. Fischel In Re: Akorn, Inc., v. Fresenius Kabi, AG, et al., In the Court of Chancery of the State of Delaware, C.A. No. 2018-0300-JTL (July 13, 2018).

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Deposition of Daniel R. Fischel In Re: Physiotherapy Holdings, Inc., et al., Debtors; PAH Litigation Trust v. Water Street Healthcare Partners, L.P., et al., In the United States Bankruptcy Court for the District of Delaware, Case No. 13-12965 (KG) (Jointly Administered) (June 5, 2018).

Deposition of Daniel R. Fischel In Re: Facebook, Inc. Class C Reclassification Litigation, In the Court of Chancery of the State of Delaware, Consolidated C.A. No. 12286-VCL (May 18, 2018).

Testimony of Daniel R. Fischel In Re: Dr. Alan Sacerdote, et al. vs. New York University, In the United States District Court for the Southern District of New York, Civil Action No. 1:16-cv-6284-KBF (April 24, 25 and 26).

Deposition of Daniel R. Fischel In Re: Daniel Turocy, et al. vs. El Pollo Loco Holdings, Inc., et al., In the United States District Court, Central District of California, Southern Division, Case No. 8:15-cv-01343-DOC-KES (April 12, 2018).

Deposition of Daniel R. Fischel In Re: United States of America v. AT&T Inc., DirecTV Group Holdings, LLC, and Time Warner Inc., In the United States District Court for the District of Columbia, Case No. 1:17-cv-02511-RJL (March 9, 2018).

Deposition of Daniel R. Fischel In Re: Dr. Alan Sacerdote, et al. vs. New York University, In the United States District Court for the Southern District of New York, Civil Action No. 1:16-cv-6284-KBF (March 1, 2018).

Testimony of Daniel R. Fischel In Re: Lehman Brothers Holdings Inc., et al., In the United States Bankruptcy Court, Southern District of New York, Chapter 11, Case No. 08-13555 (SCC) (December 4, 2017).

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Testimony of Daniel R. Fischel In Re: Genon Energy, Inc., et al. Debtors, In the United States Bankruptcy Court for the Southern District of Texas Houston Division, Chapter 11, Case No. 17-33695 (DRJ) (October 6, 2017).

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Deposition of Daniel R. Fischel In Re: United States ex re. Hendrix et al., vs. JM Manufacturing Company, Inc., et al., In the United States District Court, Central District of California, Case No. ED CV 06-00055-GW (July 20, 2017).

Testimony of Daniel R. Fischel In Re: Saquaro Power Co. v. Pioneer Americas LLC d/b/a Olin Chlor Alkali Products, In AAA Case No. 01-16-0005-1073 (June 30, 2017).

Testimony of Daniel R. Fischel In Re: Syngenta AG MIR 162 Corn Litigation, In the United States District Court for the District of Kansas, Master File No. 2:14-MD-02591-JWL-JPO (June 19, 2017).

Testimony of Daniel R. Fischel In Re: Motors Liquidation Company, f/k/a General Motors Corporation, et al., Debtors, United States Bankruptcy Court, Southern District of New York, Chapter 11, Case No.:09-50026 (MG) and Motors Liquidation Company Avoidance Action Trust, et al vs. JPMorgan Chase Bank, N.A., et al., United States Bankruptcy Court, Southern District of New York, Case No.: 09-00504 (MG) (May 2 and 3, 2017).

Deposition of Daniel R. Fischel In Re: Alere-Abbott Merger Litigation, In the Court of Chancery of the State of Delaware, Consolidated C.A. No. 12963-VCG (April 4, 2017).

Testimony of Daniel R. Fischel In Re: Appraisal of AOL Inc., In the Court of Chancery of the State of Delaware, Consol C.A. No. 11204-VCG (March 20, 2017).

Deposition of Daniel R. Fischel In Re: City of Daytona Beach Policy and Fire Pension Fund, et al vs. Examworks Group, Inc., et al., In the Court of Chancery of the State of Delaware, C.A. No. 12481-VCL (February 22, 2017).

Deposition of Daniel R. Fischel In Re: Appraisal of AOL Inc., In the Court of Chancery of the State of Delaware, Consol C.A. No. 11204-VCG (February 14 and 15, 2017).

Deposition of Daniel R. Fischel In Re: Motors Liquidation Company, f/k/a General Motors Corporation, et al., Debtors, United States Bankruptcy Court, Southern District of New York, Chapter 11, Case No.:09-50026 (MG) and Motors Liquidation Company Avoidance Action Trust, et al vs. JPMorgan Chase Bank, N.A., et al., United States Bankruptcy Court, Southern District of New York, Case No.: 09-00504 (MG) (January 31, 2017).

Deposition of Daniel R. Fischel In Re: Syngenta Litigation, In the State of Minnesota District Court, County of Hennepin Fourth Judicial District, Court File No. 27-CV-15-3785 and In Re: Syngenta AG MIR 162 Corn Litigation, In the United States District Court for the District of Kansas, Case No. 2:14-md-2591-JWL-JPO (January 20, 2017).

Testimony of Daniel R. Fischel In the Matter of Motiva Enterprises LLC vs. Bechtel Corporation, Jacobs Engineering Group, Inc. and Bechtel-Jacobs CEP Port Arthur Joint Venture, International Institute for Conflict Prevention and Resolution (October 20, 2016).

Deposition of Daniel R. Fischel in Beaver County Employees Retirement Fund, et al., vs. Cyan, Inc., et al., Superior Court of the State of California, County of San Francisco, Lead Case No. CGC-14-538355 (Consolidated with No. CGC-14-539008) (October 11, 2016).

Testimony of Daniel R. Fischel In Re: Paragon Offshore PLC, et al, Debtors, In the United States Bankruptcy Court, District of Delaware, Case No. 16-10386 (September 23, 2016).

Deposition of Daniel R. Fischel In the Matter of Motiva Enterprises LLC vs. Bechtel Corporation, Jacobs Engineering Group, Inc. and Bechtel-Jacobs CEP Port Arthur Joint Venture, International Institute for Conflict Prevention and Resolution (August 25, 2016)

Deposition of Daniel R. Fischel In Re: Syngenta AG MIR162 Corn Litigation, In the United States District Court for the District of Kansas; Case No. 2:14-MD-02591-JWL-JPO and In Re: Syngenta Litigation, In the State of Minnesota District Court, County of Hennepin, Fourth Judicial District, Case No. 27-CV-15-385 (August 11, 2016).

Deposition of Daniel R. Fischel in The Western and Southern Life Insurance Company vs. The Bank of New York Mellon, Court of Common Pleas, Hamilton County, Ohio, Case No. A 1302490 (July 27, 2016).

Testimony of Daniel R. Fischel in Herbalife, Ltd., vs. KPMG LLP, Non-Administered Arbitration of the International Institute for Conflict Prevention and Resolution, CPR Case No. 1100076998 (May 19, 2016).

Testimony of Daniel R. Fischel in iHeart Communications, Inc., f/k/a Clear Channel Communications, Inc. vs. Benefit Street Partners, et al., In the District Court of Bexar County, Texas, Cause No. 2016 CI 04006 (May 17, 2016).

Deposition of Daniel R. Fischel in iHeart Communications, Inc., f/k/a Clear Channel Communications, Inc. vs. Benefit Street Partners, et al., In the District Court of Bexar County, Texas, Cause No. 2016 CI 04006 (May 12, 2016).

Testimony of Daniel R. Fischel in U.S. Commodity Futures Trading Commission v. Igor B. Oystacher and 3 Red Trading, LLC, In the United States District Court for the Northern District of Illinois, Eastern Division, Docket No. 15 C 9196 (May 6, 2016).

Testimony of Daniel R. Fischel in Merion Capital LP and Merion Capital II, LP vs. Lender Processing Services, Inc., In the Court of Chancery of the State of Delaware, C.A. No. 9320-VCL (May 4 and 5, 2016).

Testimony of Daniel R. Fischel in iHeart Communications, Inc., f/k/a Clear Channel Communications, Inc. v. Benefit Street Partners LLC, et al., In the District Court of Bexar County, Texas, 285th Judicial District, Cause No. 2016-CI 04006 (April 5, 2016).

Deposition of Daniel R. Fischel in iHeart Communications, Inc., f/k/a Clear Channel Communications, Inc. v. Benefit Street Partners LLC, et al., In the District Court of Bexar County, Texas, 285th Judicial District, Cause No. 2016-CI 04006 (April 2, 2016).

Deposition of Daniel R. Fischel in Herbalife Ltd. vs. KPMG LLP, Non-Administered Arbitration of the International Institute for Conflict Prevention and Resolution, CPR Case No.1100076998 (March 31, 2016).

Deposition of Daniel R. Fischel in U.S. Commodity Futures Trading Commission v. Igor B. Oystacher and 3 Red Trading, LLC, In the United States District Court, Northern District of Illinois, Eastern Division, No. 15-cv-09196 (March 25, 2016).

Deposition of Daniel R. Fischel in Merion Capital LP and Merion Capital II, LP vs. Lender Processing Services, Inc., In the Court of Chancery of the State of Delaware, C.A. No. 9320-VCL (March 15, 2016).

Deposition of Daniel R. Fischel in Lawrence E. Jaffe Pension Plan, On Behalf of Itself and All Others Similarly Situated v. Household International, Inc., et al., In the United States District Court, Northern District of Illinois Eastern Division, Lead Case No. 02-C-5893 (February 24, 2016).

Deposition of Daniel R. Fischel in Robert E. Morley, Jr. and REM Holdings 3, LLC vs. Square, Inc., Jack Dorsey, and James McKelvey, Jr., United States District Court for the Eastern District of Missouri, Eastern Division, Civil Action No. 14-CV-00172-SNLJ (February 19, 2016).

Testimony of Daniel R. Fischel In the Matter of the Application of U.S. Bank National Association, The Bank of New York Mellon, et al., Supreme Court of the State of New York, County of New York, Index No. 652382/2014 (January 20 and 21, 2016).

Testimony of Daniel R. Fischel in Sangeeth Peruri v. Ameriprise Financial, Inc., et al, American Arbitration Association Case No. 01-15-0002-3991 (December 7, 2015).

Deposition of Daniel R. Fischel In the Matter of the Application of U.S. Bank National Association, The Bank of New York Mellon, The Bank of New York Mellon Trust Company, N.A., et al, In the Supreme Court of the State of New York, County of New York, Index No. 652382/2014 (December 3, 2015).

Testimony of Daniel R. Fischel in Securities and Exchange Commission v. Arkadiy Dubovoy, et al, In the United States District Court for the District of New Jersey, Civil Case No. 15-cv- 6076-MCA (October 8, 2015).

Deposition of Daniel R. Fischel in Steven A. Stender, Harold Silver and Infinity Clark Street Operating, L.L.C., on behalf of themselves and all others similarly situated v. Archstone- Smith Operating Trust, et al., in the United States District Court for the District of Colorado, Case No. 07-CV-02503-WJM-MJW (July 24, 2015).

Testimony of Daniel R. Fischel In Re: Determination of Royalty Rates and Terms for Ephemeral Recording and Digital Performance of Sound Recordings (Web IV), in the United States Copyright Royalty Judges, The Library of Congress, Docket No. 14-CRB-0001-WR (2016-2020) (May 21 and 22, 2015).

Deposition of Daniel R. Fischel In Re: Determination of Royalty Rates and Terms for Ephemeral Recording and Digital Performance of Sound Recordings (Web IV), in the United States Copyright Royalty Judges, The Library of Congress, Docket No. 14-CRB-0001-WR (2016-2020) (April 1, 2015).

Deposition of Daniel R. Fischel in MacDermid, Incorporated vs. Cookson Group, PLC, Cookson Electronics and Enthone, Inc., in the Superior Court, Judicial District of Waterbury, Docket No. UWY-CV-12-6016356-S (January 21, 2015)

Testimony of Daniel R. Fischel in the Securities and Exchange Commission vs. Samuel E. Wyly and Donald R. Miller, Jr., in his capacity as the Independent Executor of the Will and Estate of Charles J. Wyly, Jr., in the United States District Court, Southern District of New York, 10 Civ. 5760 (SAS) (November 17, 2014).

Deposition of Daniel R. Fischel In Re: Activision Blizzard, Inc. Stockholder Litigation, In the Court of Chancery of the State of Delaware, Consolidated C.A. No. 8885-VCL (October 17, 2014).

Testimony of Daniel R. Fischel in Hugh M. Caperton, Harman Development Corporation, Harman Mining Corporation, and Sovereign Coal Sales, Inc. v. A.T. Massey Coal Company, Inc., In the Circuit Court for Buchanan County, Case No. 027CL10000771-00 (May 20 and 21, 2014).

Deposition of Daniel R. Fischel in Center Partners, Ltd., et al v. Urban Shopping Centers, L.P., et al., In the Circuit Court of Cook County, Illinois, County Department, Law Division, Case No. 04 L 012194 (April 24, 2014).

Deposition of Daniel R. Fischel in Third Point LLC v. William F. Ruprecht, et al and Sotheby's, In the Court of Chancery of the State of Delaware, C.A. No. 9469-VCP (April 19, 2014).

Deposition of Daniel R. Fischel in Hugh M. Caperton, Harman Development Corporation, Harman Mining Corporation, and Sovereign Coal Sales, Inc. v. A.T. Massey Coal Company, Inc., In the Circuit Court for Buchanan County, Case No. 027CL10000771-00 (March 14, 2014).

Deposition of Daniel R. Fischel in Corre Opportunities Fund, LP, Zazove Associates LLC, DJD Group LLLP, First Derivative Traders LP, and Kevan A. Fight vs. Emmis Communications Corporation, United States District Court, Southern District of Indiana, Indianapolis Division, Case No. 1:12-cv-0491-SEB-TAB (October 4, 2013).

Testimony of Daniel R. Fischel In the Matter of the Application of The Bank of New York Mellon, (As Trustee Under Various Pooling and Servicing Agreements and Indenture Trustee under various indentures), Petitioner, for an order, pursuant to CPLR §7701, seeking judicial instructions and approval of a proposed settlement, Index No. 651786/11, Supreme Court of the State of New York, County of New York: Trial Term Part 39 (September 9 and 10, 2013).

Testimony of Daniel R. Fischel In Re: September 11 Litigation, Case No. 21 MC 97 (AKH), United States District Court for the Southern District of New York, (July 16, 2013).

Deposition of Daniel R. Fischel in Cantor Fitzgerald & Co., et al v. American Airlines, Inc., et al, Case No. 21 MC 101 (AKH), 04 CV 7318 (AKH), United States District Court, Southern District of New York (July 1, 2013).

Deposition of Daniel R. Fischel In Re: Pfizer Inc. Securities Litigation, Case No. 04 Civ. 9866 (RO) in The United States District Court for the Southern District of New York (June 28, 2013).

Testimony of Daniel R. Fischel in William T. Esrey, Julie C. Esrey, Ronald T. LeMay and Casondra C. Lemay v. Ernst & Young LLP Arbitration, Case No. 13 107 Y 02332 11 (May 29, 2013).

Deposition of Daniel R. Fischel in Christine Bauer-Ramazani and Carolyn B. Duffy, on behalf of themselves and all other similarly situated v. Teachers Insurance and Annuity Association of America – College Retirement and Equities Fund (TIAA-CREF), et al, in the United States District Court, District of Vermont, Docket No. 1:09-cv-190 (May 21, 2013).

Deposition of Daniel R. Fischel In Re: Google Inc. Class C Shareholder Litigation, In the Court of Chancery of the State of Delaware, Case No. 7469CS (May 17, 2013).

Deposition of Daniel R. Fischel In the Matter of the application of The Bank of New York Mellon (as Trustee under various Pooling and Servicing Agreements and Indenture Trustee under various Indentures), et al., Supreme Court of the State of New York, County of New York, Index No. 651786/2011 (May 9, 2013).

Deposition of Daniel R. Fischel in William T. Esrey, Julie C. Esrey, Ronald T. Lemay, and Casondra C. Lemay v. Ernst & Young, L.L.P., Before the American Arbitration Association, Case No. 1234 (May 7, 2013).

Deposition of Daniel R. Fischel in Archer Well Company, Inc. v. GW Holdings LLC and Wexford Capital LP, in the United States District Court, Southern District of New York, ECF Case No. 1:12-cv-06762-JSR (April 5, 2013).

Testimony of Daniel R. Fischel in Meso Scale Diagnostics, LLC , Meso Scale Technologies, LLC v. Roche Diagnostics GmbH, et al., In the Court of Chancery of the State of Delaware, Civil Action No. 5589-VCP (February 27, 2013).

Deposition of Daniel R. Fischel in Center Partners, Ltd. et al v. Urban Shopping Centers, L.P., et al., Circuit Court of Cook County, Illinois, No. 04 L 012194 (February 6 and 7, 2013).

Deposition of Daniel R. Fischel In Re: September 11 Litigation, United States District Court, Southern District of New York, Civil Action No. 21 MC 101 (AKH) (January 11, 2013).

Deposition of Daniel R. Fischel in Meso Scale Diagnostics, LLC, Meso Scale Technologies, LLC v. Roche Diagnostics GmbH, et al., In the Court of Chancery of the State of Delaware, Case No: 5589-VCP (November 12, 2012).

Testimony of Daniel R. Fischel in Stuart Bederman, et al. v. Archstone, f/k/a Archstone-Smith Operating Trust, Arbitration before the Honorable Bruce W. Kauffman (October 17, 2012).

Deposition of Daniel R. Fischel in David E. Brown, et al. v. Authentec, Inc. et al., In the Circuit Court of the Eighteenth Judicial Circuit in and for Brevard County, Florida, Civil Division, Case No. 05-2012-CA-57589 (September 18, 2012).

Deposition of Daniel R. Fischel in Stuart Bederman, et al. v. Archstone, f/k/a Archstone-Smith Operating Trust, Arbitration before the Honorable Bruce W. Kauffman (September 14, 2012).

Testimony of Daniel R. Fischel in Tronox, Incorporated, et al., v. Kerr-McGee Corporation, et al., United States Bankruptcy Court, Southern District of New York, Adversary Proceeding No. 09-10098(ALG) (August 7, 8 and 9, 2012).

Deposition of Daniel R. Fischel In re McAfee, Inc. Shareholder Litigation, Superior Court of the State of California, County of Santa Clara, Lead Case No. 1:10-cv-180413 (August 2, 2012).

Testimony of Daniel R. Fischel in Kraft Foods Global, Inc., v. Starbucks Corporation, Arbitration Before JAMS, Arbitration No. 1340008345 (July 31, 2012).

Deposition of Daniel R. Fischel in Altana Pharma AG, and Wyeth v. Teva Pharmaceuticals USA, Inc. and Teva Pharmaceutical Industries, Ltd., In the United States District Court, District of New Jersey, Consolidated Civil Action Nos. 04-2355 (JLL)(CCC), 05-1966 (JLL)(CCC), 05-3920 (JLL)(CCC) and 05-3672 (JLL)(CCC) (June 1, 2012).

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Deposition of Daniel R. Fischel in Capital One Financial Corporation v. John A. Kanas and John Bohlisen, In the United States District Court for the Eastern District of Virginia, Alexandria Division, Civil Action No. 1:11-cv-750 (LO/TRJ) (May 10, 2012).

Deposition of Daniel R. Fischel In Re: Pfizer Inc. Securities Litigation, In the United States District Court, Southern District of New York, Case 1:04-cv-09866-LTS-HBP (May 3, 2012).

Deposition of Daniel R. Fischel in Willie R. Pittman, Susan B. Seales and Stephen T. Selzer vs. J. Coley Clark, Moneygram International, Inc., et al., In the Court of Chancery of the State of Delaware, C.A. No. 6387-VCL (April 26, 2012).

Deposition of Daniel R. Fischel in Chona Allison, et al v. CRC Insurance Services, Inc., In the United States District Court for the Northern District of Illinois, Eastern Division, Case No. 10-3313 (March 14 and 15, 2012).

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Deposition of Daniel R. Fischel In Re: National Union Fire Insurance Company of Pittsburgh, PA v. Wells Fargo Bank, N.A., District Court of Harris County, Texas, 125th Judicial District, No. 88-49246 (April 10 and 11, 1989).

Deposition of Daniel R. Fischel In Re: Susan Rothenberg, as Custodian for Stephen J. Rothenberg v. Charles E. Hurwitz, United Financial Corporation, United Savings Association of Texas, et al., United States District Court for the Southern District of Texas, Houston Division, Civil Action No. H-86-1435 (March 30, 1989).

Deposition of Daniel R. Fischel In Re: Jose Nodar, et al. v. William Weksel, Albert Bromberg, Henry B. Turner, IV, Frank L. Bryant, Leo Kuperschmid, Bennett S. Lebow, Ernst & Whinney and Oppenheimer & Co., Inc., United States District Court, Southern District of New York, No. 84 Civ. 3870 (VLB) and consolidation case No. 84 Civ. 5132 (VLB) (December 15 and 16, 1988).

Deposition of Daniel R. Fischel In Re: William Steiner, et al. v. Whittaker Corporation, et al., Superior Court of the State of California for the County of Los Angeles, No. CA000817 (December 7, 1988).

Deposition of Daniel R. Fischel In Re: Arnold I. Laven, et al. v. Western Union Corporation, et al., United States District Court for the District, Western District of Washington, MDL No. 551 (August 30 and 31, 1988).

Deposition of Daniel R. Fischel In Re: Washington Public Power Supply System Securities Litigation, United States District Court, Western District of Washington, MDL No. 551 (August 16 and 22, 1988).

Affidavit of Daniel R. Fischel In Re: District Business Conduct Committee for District No. 3 v. Blinder, Robinson & Company Inc., et al., National Association of Securities Dealers, Inc. National Business Conduct Committee, Complaint No. DEN-666 (July 21, 1988).

Deposition of Daniel R. Fischel In Re: Joseph Seidman, et al. v. Stauffer Chemical Company, et al., United States District Court for the District of Connecticut, No. B 84-543 (TFGD) (June 10, 1988 and May 5, 1987).

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Deposition of Daniel R. Fischel In Re: MicroPro Securities Litigation, United States District Court for the Northern District of California, No. C-85-7428-EFL (A) (May 2, 1988).

Affidavit of Daniel R. Fischel In Re: Pizza Time Theatre Securities Litigation, United States District Court for the Northern District of California, Civil File No. 84-20048-(A)-RPA (March 25, 1988).

Affidavit of Daniel R. Fischel and Robert A. Sherwin In Re: First National Bank of Louisville v. Brooks Farms, and George C. Brooks, et al., Third-Party Plaintiffs v. A. O. Smith Corporation, et al., Circuit Court for Maury County, Tennessee, No. 2058 (March 3, 1988).

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Deposition of Daniel R. Fischel In Re: Nucorp Energy Securities Litigation, United States District Court for the Southern District of California, M.D.L. 514 (January 27, 1988).

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Testimony of Daniel R. Fischel In Re: Securities and Exchange Commission v. First City Finance Corporation Ltd., and Marc Belzberg, United States District Court for the District of Columbia, Civil Action No. 86-2240 (December 18, 1987).

Testimony of Daniel R. Fischel In Re: The Irvine Company v. Athalie Irvine Smith and Athalie R. Clarke, Trustee, State of Michigan Circuit Court for the county of Oakland, Civil Action No. 8327011-CZ (December 14, 15, and 16, 1987).

Deposition of Daniel R. Fischel In Re: Securities and Exchange Commission v. First City Finance Corporation, Ltd. and Marc Belzberg, United States District Court for the District of Columbia, Civil Action No. 86-2240 (December 11, 1987).

Affidavit of Daniel R. Fischel In Re: Gerald D. Broder and Constance D. Broder v. Alphonse H. Bellac and William B. Weinberger v. Combustion Equipment Associates, Inc., et al., and William B. Weinberger v. Coopers & Lybrand, United States District Court for the Southern District of New York, 80 CIV 6175 (CES) 80 CIV 6839 (CES) 84 CIV 8217 (CES) (July 22, 1987).

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Testimony of Daniel R. Fischel In Re: NVHomes, L.P. v. Ryan Homes, Inc.; and Ryan Homes, Inc. v. NVHomes, L.P., et al., United States District Court for the Western District of Pennsylvania, Civil Action No. 86-2139 (October 24, 1986).

Supplemental Affidavit of Daniel R. Fischel In Re: NVHomes, L.P. v. Ryan Homes, Inc.; and Ryan Homes, Inc. v. NVHomes, L.P. and NVAcquisition L.P., et al., United States District Court the Western District of Pennsylvania, Civil Action No. 86-2139 (October 24, 1986).

Affidavit of Daniel R. Fischel in Support of the Motion by the Activision Defendants for Summary Judgment In Re: Activision Securities Litigation, United States District Court for the Northern District of California, Master File No. C-86-2139 (October 20, 1986).

Declaration of Daniel R. Fischel in Support of the Motion by the Activision Defendants for Summary Judgment In Re: Activision Securities Litigation, United States District Court for the Northern District of California, Master File No. C-83-4639(A)-MHP (October 2, 1986).

Affidavit in Support of Defendants Motion for Summary Judgment In Re: MCorp Securities Litigation, United States Court for the Southern District of Texas, Civil Action No. H-85- 5894 (September 25, 1986).

Deposition of Daniel R. Fischel In Re: Activision Securities Litigation, United States District Court for the Northern District of California, No. C 83 4639 (August 18 and 19, 1986).

Deposition of Daniel R. Fischel In Re: John Mancino v. James A. McMaghan, et al., United States District Court for the Northern District of California, Civil No. C-84-0407-TEH (August 14, 1986).

Testimony of Daniel R. Fischel In Re: Charles W. Leigh, et al. and George Johnson, et al. v. Clyde William Engle, et al., United States District Court for the Northern District of Illinois, Eastern Division, Case No. 78 C 3799 (August 1, 1986).

Reply Affidavit of Daniel R. Fischel In Re: The Amalgamated Sugar Company v. NL Industries, United States District Court for the Southern District of New York, 86 Civ. 5010 (VLB) (July 28, 1986).

Affidavit of Daniel R. Fischel In Re: The Amalgamated Sugar Company v. NL Industries, United States District Court for the Southern District of New York, 86 Civ. 5010 (VLB) (July 18, 1986).

Deposition of Daniel R. Fischel In Re: Charles W. Leigh, et al. and George Johnson, et al. v. Clyde William Engle, et al., United States District Court for the Northern District of Illinois, Eastern Division, Case No. 78 C 3799 (July 1, 1986).

Deposition of Daniel R. Fischel In Re: Seafirst Corporation v. William M. Jenkins, et al.; and Seafirst Corporation v. John R. Boyd, et al., United States District Court for the Western District of Washington at Seattle, Case No. C83-771R (February 27, 1986).

Deposition of Daniel R. Fischel In Re: Kreindler v. Sambo's Restaurants, Inc., United States District Court for the Southern District of New York, Case No. 79 Civ. 4538 (December 17, 1985).

Affidavit of Daniel R. Fischel In Re: United States of America v. S. Richmond Dole and Clark J. Matthews II (March 19, 1985).

Deposition of Daniel R. Fischel In Re: Craig T. McFarland, et al. v. Memorex Corporation, United States District Court for the Northern District of California, No. C 79-2926-WAI, C 79-2007-WAI, C 79-241-WAI (February 26, 1985; January 29 and 30, 1985).

Testimony of Daniel R. Fischel In Re: Robert J. Lawrence v. Grumman Corp. Pension Plan, et al., United States District Court for the Eastern District of New York, No. CV-81-3530 (December 19, 1983).

Testimony of Daniel R. Fishel In Re: Telvest, Inc. v. Junie L. Bradshaw, et al. and American Furniture Company, United States District Court, for the Eastern District of Virginia Richmond Division, No. CA-79-0722-R (December 4, 1981).

OTHER ACTIVITIES

Member, American Economic Association, American Finance Association.

Former Member of the Board of Overseers of the Becker-Friedman Institute at the University of Chicago.

Former Advisor to the Harvard Program on Corporate Governance at Harvard University. Former

Member, Board of Directors, Center for the Study of the Economy and the State. Former Member, Mid-

America Institute Task Force on Stock Market Collapse.

Have acted as a consultant and/or advisor to the New York Stock Exchange, the National Association of Securities Dealers, the Chicago Board of Trade, the Chicago Board Options Exchange, the Chicago Mercantile Exchange, the New York Mercantile Exchange, the Federal Trade Commission, the Department of Labor, the Securities and Exchange Commission, the Canadian Securities and Exchange Commission, the United States Department of Justice, the Federal Deposit Insurance Corporation, the Resolution Trust Corporation, the Federal Housing Finance Agency, and the Office of Thrift Supervision.

Referee, Journal of Financial Economics, Journal of Law and Economics, Journal of Legal Studies.

Participant and speaker at multiple conferences on the Economics of Corporate, Securities and Commodities Law and the Regulation of Financial Markets.

Former Chairman, American Association of Law Schools' Section on Law and Economics.

APPENDIX D

03:26:05 1 THE COURT: Okay.

03:26:05 2 You know what, he can step up once you call him.

03:26:09 3 MR. MENCHEL: Sure.

03:26:10 4 THE COURT: Let's bring them in.

03:26:18 5 Mr. Pavlis, I'll first ask if Mr. Bases intends to

03:26:21 6 present anyone and then --

03:26:23 7 MS. PORTER: I'll answer your question. Thank you,

03:26:25 8 Judge.

03:27:16 9 (Jury in.)

03:27:25 10 THE COURT: Ms. Porter, does Mr. Bases wish to

03:27:27 11 present any witnesses at this time?

03:27:28 12 MS. PORTER: Your Honor, we don't. Mr. Bases rests

03:27:30 13 his case.

03:27:31 14 THE COURT: Thank you.

03:27:32 15 Mr. Menchel, does Mr. Pacilio wish to present any

03:27:36 16 witnesses at this time?

03:27:37 17 MR. MENCHEL: Yes, your Honor. We'd like to call

03:27:39 18 Professor Daniel Fischel to the stand.

03:27:41 19 THE COURT: Professor Fischel, if you would come up

03:27:43 20 to my left.

21 And, sir, if you would remain standing and be sworn

22 in.

03:28:19 23 DANIEL FISCHEL, DEFENDANT PACILIO'S WITNESS, SWORN

03:28:12 24 THE COURT: Please, sir, take a seat.

25 THE WITNESS: Good afternoon, your Honor.

03:28:14 1 THE COURT: And please remove your mask.

2 THE WITNESS: Thank you.

03:28:15 3 THE COURT: You may proceed, Mr. Menchel.

03:28:17 4 MR. MENCHEL: Thank you, your Honor.

5 DIRECT EXAMINATION

6 BY MR. MENCHEL:

03:28:20 7 Q. Professor Fischel, good afternoon.

03:28:22 8 A. Good afternoon.

03:28:22 9 Q. Where are you employed?

03:28:23 10 A. I'm employed at two places: At the University of Chicago
03:28:30 11 and at a consulting firm by the name of Compass Lexecon.

03:28:34 12 Q. What is your position at the University of Chicago?

03:28:36 13 A. Currently, I'm the Lee and Brenna Professor of Law and
03:28:42 14 Business Emeritus at the University of Chicago Law School.

03:28:45 15 Q. What does that all mean?

03:28:46 16 A. Well, I spent much of my career as an active member of the
03:28:58 17 faculty. Being awarded a chair is generally understood as a
03:29:03 18 kind of recognition of accomplishment. And being emeritus
03:29:08 19 means pretty much I've retired from being an active member of
03:29:13 20 the faculty.

03:29:14 21 Q. And the second job that you mentioned was with a company
03:29:19 22 called Compass Lexecon; is that right?

03:29:21 23 A. That's correct.

03:29:22 24 Q. What is Compass Lexecon?

03:29:24 25 A. Compass Lexecon is an economics consulting firm that

03:29:29 1 specializes in the application of economics primarily to
03:29:35 2 various legal and regulatory proceedings.

03:29:39 3 Q. What is your position there, sir?

03:29:41 4 A. I'm the chairman and the president of the company.

03:29:44 5 Q. Where are they located?

03:29:47 6 A. Well, it's now become a worldwide business. So, we're
03:29:52 7 really located all over the world. Our main office is in
03:29:56 8 Chicago, but we have multiple offices in the United States,
03:30:02 9 multiple offices in Europe. We have offices in South America.
03:30:06 10 We have offices in Asia. We have an office in Israel. So,
03:30:11 11 really a worldwide business.

03:30:12 12 Q. And what types of people work at Compass Lexecon,
03:30:15 13 primarily?

03:30:15 14 A. Almost exclusively economists and people with related
03:30:23 15 skills to economists, such as computer programmers, for
03:30:28 16 example, or financial analysts. We also have a big research
03:30:32 17 staff. We also have various affiliations with experts in
03:30:40 18 various fields, including several Nobel Prize winners in
03:30:45 19 economics. And occasionally we engage with -- if we don't
03:30:52 20 have somebody with a particular expertise, we form an
03:30:57 21 association for a particular matter or series of matters.

03:31:00 22 Q. And who are Compass Lexecon's clients?

03:31:04 23 A. Well, they're the range of parties that can be involved in
03:31:14 24 legal and regulatory proceedings. So, obviously the United
03:31:16 25 States government is a major client of ours. Many companies

03:31:22 1 are clients. Various investors and investor groups are
03:31:28 2 clients. State and local governments are clients.

03:31:33 3 So, it really just depends on the type of issue and
03:31:38 4 the type of party that's involved in a particular legal or
03:31:41 5 regulatory dispute.

03:31:43 6 Q. Now, you mentioned earlier that you are the chairman and
03:31:46 7 the president of Compass Lexecon; is that right?

03:31:48 8 A. That's correct.

03:31:48 9 Q. And as such, what are your responsibilities at the
03:31:51 10 company?

03:31:53 11 A. Well, I have basically two types of responsibilities.
03:31:58 12 One, because I am the chairman and the president, I have
03:32:02 13 overall responsibility for the whole company and the
03:32:07 14 operations of the company and the finances of the company and
03:32:10 15 the personnel -- the major personnel decisions of the company.
03:32:15 16 So, that's one part of my job.

03:32:17 17 The other part of my job is I have a very active
03:32:21 18 consulting practice and practice as an expert witness as I'm
03:32:27 19 doing here.

03:32:27 20 Q. Have you -- you mentioned the University of Chicago and
03:32:35 21 your current position. Have you held other positions at the
03:32:38 22 University of Chicago before?

03:32:39 23 A. Yes. I served for a number of years as dean of the
03:32:45 24 University of Chicago Law School. I also was director of the
03:32:53 25 university-wide law and economics program at the university

03:32:56 1 for many years. And also for a number of years, I had a
03:33:02 2 courtesy appointment at the University of Chicago Graduate
03:33:04 3 School of Business, where I also taught.

03:33:08 4 Q. Have you held academic positions at other universities?

03:33:13 5 A. Yes. I also have had a close relationship with
03:33:15 6 Northwestern University in Chicago. And, again, I was a
03:33:23 7 chaired visiting professor there, as well as also having a
03:33:27 8 courtesy appointment in the graduate school of business at
03:33:29 9 Northwestern.

03:33:30 10 Q. So, at both those schools, the University of Chicago and
03:33:33 11 Northwestern University, what types of classes have you
03:33:36 12 taught?

03:33:37 13 A. I taught a number of different classes in a number of
03:33:43 14 different areas. But I would say my principal focus was in
03:33:46 15 the area of business associations and corporate finance, the
03:33:53 16 economics of financial markets and generally the application
03:33:57 17 of economics to various issues that come up in legal
03:34:05 18 proceedings.

03:34:05 19 Q. You taught those classes in law school?

03:34:09 20 A. Yes, but I've also taught in business school, as I said.

03:34:12 21 Q. Now, can you briefly describe your educational background,
03:34:17 22 please.

03:34:18 23 A. I went to Cornell University where I got a bachelor's
03:34:23 24 degree in history with a minor in economics in 1972. Then I
03:34:30 25 went to graduate school in history, actually, where I got a

03:34:34 1 master's degree from Brown University in 1974. And, then, I
03:34:39 2 got a law degree from the University of Chicago in 1977, where
03:34:44 3 I really began my study of law and economics.

03:34:48 4 Q. And where did you first begin working after you graduated
03:34:51 5 from law school?

03:34:52 6 A. I had the great privilege of being selected as a law
03:35:00 7 clerk, first for the Honorable Thomas Fairchild, who was then
03:35:03 8 the chief judge of the Seventh Circuit, actually right in this
03:35:07 9 building where I worked. And, then, after that, as I said,
03:35:13 10 the great privilege of being selected as a law clerk for the
03:35:16 11 Honorable Potter Stewart, who was then a justice on the United
03:35:21 12 States Supreme Court.

03:35:22 13 Q. The Supreme Court?

03:35:23 14 A. United States Supreme Court, correct.

03:35:24 15 Q. Now, I want to talk a little bit about your publications.
03:35:28 16 Have you published any books or articles?

03:35:30 17 A. Yes. I've published a number of books, as well as I think
03:35:38 18 approximately 50 articles in legal and economics journals.

03:35:42 19 Q. And have any of your books or articles ever been cited by
03:35:46 20 any court?

03:35:47 21 A. Yes. My articles have been cited hundreds of times by
03:35:53 22 courts of all levels, from the United States Supreme Court on
03:35:57 23 down.

03:35:57 24 Q. And do any of your books or articles cover the same issues
03:36:02 25 that are relevant to this case?

03:36:05 1 A. Yes. I've written about the economics of manipulation
03:36:14 2 and, in a variety of contexts, the reaction of market
03:36:21 3 participants to trades or orders. The informational effect of
03:36:27 4 those kinds of actions in the -- really, across different
03:36:33 5 types of markets, stock markets, futures markets. And also in
03:36:40 6 connection with not just manipulation cases, but insider
03:36:44 7 trading cases, fraud cases, all of which involve similar
03:36:47 8 issues of trying to interpret the meaning of orders or trades
03:36:53 9 and the informational content that's associated with those
03:36:56 10 particular actions.

03:36:58 11 Q. And you used the phrase manipulation a couple of times in
03:37:01 12 that answer. Are you referring to market manipulation?

03:37:03 13 A. Yes.

03:37:03 14 Q. Have you ever served as a consultant on economic issues to
03:37:09 15 any government agencies or regulatory bodies?

03:37:13 16 A. Yes. I've been a frequent expert witness for the United
03:37:18 17 States Department of Justice. I've also been an expert
03:37:22 18 witness for a number of other government agencies. I've also
03:37:26 19 been an economic consultant on various regulatory issues to a
03:37:35 20 wide variety of regulatory bodies, the United States
03:37:40 21 Securities and Exchange Commission, the various commodities
03:37:45 22 exchanges, the New York Stock Exchange, the National
03:37:51 23 Association of Securities Dealers. So, it's a fairly long
03:37:54 24 list.

03:37:54 25 Q. Okay.

03:37:54 1 I'm going to ask you some questions about your prior
03:37:56 2 experience as an expert.

03:37:58 3 Have you ever testified in a court of law as an
03:38:00 4 expert before?

03:38:00 5 A. Yes, many times.

03:38:01 6 Q. Approximately how many?

03:38:02 7 A. Well, I've been doing it for a long time. So, I think
03:38:08 8 over, you know, close to a 40-year period, I think I've
03:38:12 9 testified in approximately a hundred trials or arbitrations.

03:38:17 10 Q. In what courts?

03:38:19 11 A. Well, again, courts of all different types in all
03:38:26 12 different places. Certainly, in the Northern District of
03:38:30 13 Illinois where we are now, which is where I live. But also in
03:38:36 14 federal and state courts across the country.

03:38:39 15 Q. Have you ever testified as an expert in cases involving
03:38:44 16 issues that are similar to the issues that are presented here,
03:38:47 17 meaning market manipulation, and the like?

03:38:50 18 A. Yes, I have.

03:38:51 19 Q. Can you describe that, please?

03:38:53 20 A. Well, I testified a number of years ago in another matter
03:39:03 21 involving alleged spoofing. And as I said, many of the cases
03:39:12 22 that I've been involved in, whether they're manipulation
03:39:16 23 cases, insider trading cases, securities fraud cases, all
03:39:20 24 involve similar issues of how to interpret trading behavior in
03:39:26 25 terms of what information is communicated to market

03:39:30 1 participants based on either trades or orders or similar types
03:39:37 2 of actions.

03:39:38 3 Q. Does that also include or involve how traders react to the
03:39:42 4 actions of other traders?

03:39:44 5 A. Yes. I mean, that's very much the point.

03:39:46 6 Q. Right.

03:39:48 7 MR. MENCHEL: Your Honor, I would tender Professor
03:39:50 8 Fischel as an expert in the field of economics and financial
03:39:54 9 markets.

03:39:54 10 THE COURT: Any objection?

03:39:55 11 MR. ARMSTRONG: No, your Honor.

03:39:56 12 THE COURT: All right. So accepted.

03:39:59 13 THE WITNESS: Thank you, your Honor.

14 BY MR. MENCHEL:

03:40:01 15 Q. Now, Professor, can you describe what you understood your
03:40:06 16 assignment to be in this case?

03:40:07 17 A. Really to analyze the economic evidence, particularly
03:40:12 18 based on the, sort of, voluminous database of trades and
03:40:18 19 orders to analyze the particular claims made by the
03:40:26 20 government, particularly in connection with their 1-to-50
03:40:32 21 sequence that they have focused on in connection with trading
03:40:35 22 behavior.

03:40:35 23 Q. And when you say 1-to-50 sequence, are you referring to
03:40:40 24 the episodes that were numbered 1 to 50 in the Government's
03:40:44 25 Exhibit 1?

03:40:45 1 A. Yes, exactly.

03:40:46 2 Q. Now, how long has Compass Lexecon, approximately, been
03:40:49 3 working on this matter?

03:40:50 4 A. I think approximately two-and-a-half years.

03:40:51 5 Q. And how much work has Compass Lexecon had to do in
03:40:56 6 preparation for your testimony today?

03:40:57 7 A. Really a massive amount of work because of all of the
03:41:04 8 trading data over a multi-year period from two different data
03:41:12 9 sources. Really, just a -- sort of every order, every trade
03:41:19 10 over -- you know, beginning in 2008 to 2014, and from another
03:41:29 11 data source from 2009 to 2014. Just -- it's really hard to
03:41:38 12 describe how much data that includes. Every trade, every
03:41:45 13 order, every change in trade. Everything that changed over
03:41:51 14 every millisecond, which is the way that the data is
03:41:58 15 presented.

03:41:59 16 It's something that no human being could do without
03:42:01 17 massive computer capability and constant analysis in response
03:42:08 18 to just your own analysis of the data, but also analyzing all
03:42:16 19 of the government's claims, the government's exhibits, the
03:42:20 20 changing exhibits that were presented by the government, the
03:42:26 21 possibility of certain witnesses and their prior testimony and
03:42:32 22 what they testified about in other cases that wound up not
03:42:36 23 appearing. It's just a -- really an astronomical amount of
03:42:42 24 data.

03:42:42 25 Q. You mentioned two datasets. Are you referring to what was

03:42:46 1 called the RAPID data and the ARMADA data?

03:42:48 2 A. Yes, exactly.

03:42:48 3 Q. And, to date, approximately how much has Compass Lexecon

03:42:52 4 billed for this work?

03:42:53 5 A. I think approximately \$4.6 million.

03:42:56 6 Q. Now, have you prepared an exhibit setting forth your

03:43:00 7 understanding of the government's claims concerning the

03:43:02 8 alleged fraudulent scheme in this case?

03:43:04 9 A. Yes.

03:43:04 10 Q. If you would, please, I want to show you what has been

03:43:09 11 marked as DX 811.

03:43:12 12 MR. MENCHEL: This is for the witness only at this

03:43:14 13 point, your Honor.

14 BY MR. MENCHEL:

03:43:16 15 Q. Professor Fischel, do you recognize what is being shown to

03:43:19 16 you marked as Defendants' Exhibit 811?

03:43:21 17 A. I do.

03:43:22 18 Q. What is it, please?

03:43:23 19 A. This is my understanding of what the government has

03:43:27 20 referred to as the four-step fraudulent scheme that worked

03:43:31 21 like clockwork.

03:43:33 22 MR. MENCHEL: Your Honor, I would offer Defendants'

03:43:35 23 Exhibit 811 for demonstrative purposes only.

03:43:38 24 THE COURT: Any objection?

03:43:39 25 MR. ARMSTRONG: Your Honor, could we be heard at

03:43:42 1 sidebar.

03:43:50 2 (Proceedings had at sidebar:)

03:43:53 3 MR. ARMSTRONG: Your Honor, unfortunately it's not up
03:43:55 4 on the screen anymore. So, I'm in your Honor's situation,
03:43:59 5 where I'm driving blind.

03:44:00 6 But it seemed to be an argumentative summary of
03:44:05 7 statements that I made during opening and other facts. And
03:44:11 8 that doesn't seem to be proper demonstrative material. It
03:44:14 9 seems more like it's just argumentative.

03:44:18 10 MR. MENCHEL: That's the point of a demonstrative
03:44:20 11 exhibit. It argues something. That's why it's not going back
03:44:23 12 to the jury. This is his understanding of what the claims are
03:44:27 13 here that he was tasked to evaluate.

03:44:30 14 THE COURT: This is Dr. Fischel's understanding of
03:44:33 15 the claims.

03:44:34 16 MR. MENCHEL: That's correct.

03:44:36 17 THE COURT: Can I see it again?

03:44:40 18 Joe, can you turn off the white noise.

03:45:10 19 (Proceedings had in open court:)

03:45:10 20 THE COURT: The objection is overruled. The
03:45:12 21 defendants can use Defendants' Exhibit 811 as a demonstrative
03:45:16 22 for demonstrative purposes only.

03:45:18 23 MR. MENCHEL: Can you publish that, please, your
03:45:21 24 Honor.

25 BY MR. MENCHEL:

03:45:24 1 Q. So, Professor, do you see what's on the screen as

03:45:27 2 Defendants' Exhibit 811 for demonstrative purposes?

03:45:30 3 A. I do.

03:45:30 4 Q. Can you walk through the jury, please, your understanding

03:45:33 5 of what the fraudulent scheme was and what your assignment was

03:45:36 6 in this case?

03:45:36 7 A. Yes, these are the four steps that that make up the claim

03:45:42 8 of a fraudulent scheme. So, and I'll just walk through it.

03:45:48 9 So, step one -- and I'm focused on Mr. Pacilio

03:45:53 10 because that's the client who retained me in this matter. But

03:45:58 11 in step one, Mr. Pacilio places an iceberg order on one side

03:46:05 12 of the market. The particular example really doesn't matter,

03:46:12 13 but it's -- that is the order that is the object of the

03:46:18 14 scheme, to have that order filled.

03:46:22 15 And, then, step two, according to the government's

03:46:27 16 allegation -- allegations -- is that Mr. Pacilio would then

03:46:33 17 place a large visible order on the opposite side of the

03:46:41 18 iceberg.

03:46:43 19 And that, moving to number three, the government

03:46:49 20 claims that the purpose of placing the visible order on the

03:46:56 21 opposite side of the iceberg is to induce other traders who

03:47:05 22 see the large, visible order on the opposite side of the

03:47:11 23 iceberg to believe that that particular trader that's placing

03:47:18 24 the large order -- in this case, Mr. Pacilio -- knows

03:47:23 25 something about how prices are going to move; and, therefore,

03:47:28 1 other traders trade in the same direction as the visible order
03:47:38 2 and move -- because they're trading in the same direction,
03:47:44 3 they move closer and closer to the objective of the scheme,
03:47:49 4 the step one, the iceberg.

03:47:56 5 And moving to step four, which is --

03:47:58 6 MR. PERRY: Your Honor, could I just interject very
03:48:00 7 briefly, here. Could I just be heard very briefly on this
03:48:02 8 before we proceed with step four.

03:48:11 9 (Proceedings had at sidebar:)

03:48:11 10 MR. PERRY: Here's the issue. This is not actually
03:48:13 11 what we claimed, right? That's the problem is he is saying
03:48:16 12 that our claim is that the scheme is the first two steps and
03:48:20 13 that step four proves steps one and two. In other words, he's
03:48:26 14 saying that we say that the scheme is placing icebergs
03:48:31 15 opposite visible orders and that the evidence of that scheme
03:48:36 16 is that the orders were canceled like clockwork.

03:48:39 17 That's not actually what we're alleging. We're
03:48:42 18 alleging about a scheme that involves the rapid placement of
03:48:46 19 orders, not as evidence of the scheme, but as an integral part
03:48:49 20 of the scheme. That's actually a crucial distinction because
03:48:53 21 what he's doing is expanding the universe from actually the
03:48:57 22 four-step process, which includes the necessary step of
03:49:01 23 cancelling orders quickly after placement, to only having two
03:49:06 24 steps, which is iceberg opposite a visible order, and then
03:49:09 25 claiming that we think that step four is actually evidence of

03:49:14 1 the only -- the two-step scheme.

03:49:17 2 I know that that's complicated, but what he is
03:49:20 3 claiming is our scheme and showing the jury as our claim is
03:49:23 4 not actually our claim.

03:49:28 5 THE COURT: Mr. Menchel?

03:49:30 6 MR. MENCHEL: Judge, that's what cross-examination is
03:49:32 7 for. This is the four steps they opened on. I'm not really
03:49:37 8 sure I even understand the argument. But if they think this
03:49:40 9 is not the scheme, they can cross him on it.

03:49:44 10 MR. PERRY: No, they don't get to define what our
03:49:46 11 scheme is by showing something to the jury that isn't our
03:49:49 12 scheme, and then say, well, you can cross on it, even though
03:49:52 13 it's misleading.

03:50:53 14 THE COURT: All right. So far, he has -- well, his
03:50:57 15 description is correct, right? Steps one, two and three.

03:51:03 16 MR. PERRY: So far. The problem is that he is
03:51:05 17 construing step four as evidence that steps one and two were
03:51:11 18 executed with the intent, right? Whereas, we are building
03:51:15 19 step four as part of the necessary process.

03:51:17 20 So, just to give an example of why this is
03:51:19 21 problematic, what he is saying is the government has defined a
03:51:23 22 scheme as: Every time there's a visible order opposite an
03:51:26 23 iceberg order. And the reason the government is claiming that
03:51:29 24 that's problematic is because, like clockwork, every time
03:51:32 25 there's a visible order opposite an iceberg order there's a

03:51:35 1 quick cancellation. That's not what we're claiming. We're
03:51:38 2 not claiming every time there's a visible order opposite an
03:51:41 3 iceberg order there's a quick cancellation. That's not what
03:51:44 4 the evidence is of our scheme and it's not how we've defined
03:51:48 5 our scheme.

03:51:48 6 What we are claiming is when there's an iceberg
03:51:50 7 opposite a visible order and the visible order is canceled
03:51:54 8 quickly, that is the scheme. And that's completely different
03:51:55 9 and it expands what is a fairly narrow universe within the --

03:52:00 10 THE COURT: So, I'm just trying to understand the
03:52:03 11 difference.

03:52:06 12 Mr. Perry, in your view, the difference is that in
03:52:11 13 the government's case -- theory of the case -- the
03:52:19 14 cancellation is part of the scheme.

03:52:20 15 MR. PERRY: Yes.

03:52:20 16 THE COURT: And what you're saying is the way you see
03:52:25 17 Dr. Fischel's testimony is that the cancellation is not an
03:52:31 18 integral part of the scheme, it's just something that happens.

03:52:36 19 MR. PERRY: Correct.

03:52:37 20 And I have no objection to him, you know, bringing in
03:52:40 21 the testimony of -- you know, the evidence of everything that
03:52:43 22 he looked at, icebergs opposite visible orders, all of that.
03:52:47 23 But to claim that our scheme is simply limited to two steps,
03:52:52 24 icebergs opposite visible orders, is not what we've alleged in
03:52:55 25 the indictment and not what we've, you know, put on evidence

03:52:59 1 at the trial. Because the way that he's defining it is every
03:53:03 2 time you have an iceberg opposite a visible order, even if the
03:53:07 3 visible order is canceled ten minutes later. We have not said
03:53:09 4 anything close to that.

03:53:10 5 THE COURT: So, with that, I agree with Mr. Menchel
03:53:13 6 that that is the stuff of cross-examination. If, in fact, Dr.
03:53:19 7 Fischel's construction of the government's allegations is
03:53:21 8 completely wrong, then it seems like you could -- it would be
03:53:24 9 rather simple to bring that up in cross. So far, I don't hear
03:53:28 10 anything that is particularly objectionable.

03:53:30 11 So, let's move on.

03:53:31 12 MR. PERRY: Thank you.

03:53:35 13 (Proceedings had in open court:)

03:53:43 14 MR. MENCHEL: Just trying to remember where we were.

03:53:45 15 MR. PERRY: Step four.

03:53:46 16 THE COURT: Step four.

03:53:48 17 MR. MENCHEL: Okay.

18 BY MR. MENCHEL:

03:53:50 19 Q. Professor, I think you were about to discuss step four?

03:53:53 20 A. Yes.

03:53:56 21 So, step four is that, after step three, the
03:54:08 22 placement of the visible order opposite the iceberg with the
03:54:13 23 expectation or the belief that other traders will trade in the
03:54:17 24 same direction and increase the probability of hitting the
03:54:29 25 initial iceberg -- step one, which is the objective of the

03:54:33 1 scheme -- step four is the visible order's result in the
03:54:37 2 iceberg order executing at least in part, as the government
03:54:42 3 claims Mr. Pacilio intended from the beginning. And now that
03:54:47 4 the purpose of the scheme has been achieved, according to the
03:54:53 5 government, Mr. Pacilio then cancels the visible order, as the
03:54:59 6 government alleges was planned from the very beginning, which
03:55:04 7 is step four.

03:55:05 8 Q. And have you reviewed the subset of the government's 72
03:55:11 9 trial episodes that include trading by Mr. Pacilio?

03:55:13 10 A. I have.

03:55:14 11 Q. And do you understand that of those, only 27 involve Mr.
03:55:16 12 Pacilio; is that right?

03:55:17 13 A. I understand that.

03:55:18 14 Q. And have you also reviewed other trading sequences
03:55:23 15 involving Mr. Pacilio in which large visible orders were
03:55:26 16 placed opposite icebergs?

03:55:28 17 A. Yes, I have.

03:55:29 18 Q. And based on that analysis, have you formed any opinions
03:55:33 19 about the government's case?

03:55:34 20 A. Yes, I have. That the government's case is based on a
03:55:41 21 really basic fundamental misunderstanding of trading behavior.
03:55:46 22 And also that the sample of orders and trades that the
03:55:53 23 government includes in its four-step fraudulent scheme is a
03:56:00 24 biased and unrepresentative sample of Mr. Pacilio's trading
03:56:07 25 behavior.

03:56:07 1 In other words, there are many visible orders placed
03:56:11 2 by Mr. Pacilio opposite icebergs. That there are many large
03:56:18 3 orders that Mr. Pacilio places.

03:56:22 4 And I think to really form an accurate understanding
03:56:26 5 of the data, you can't limit the data to what appears in these
03:56:33 6 four steps given the massive amount of data that exists. I
03:56:38 7 think you have to look at all of it to have a reasonable
03:56:42 8 understanding of the data and what the data shows.

03:56:47 9 Now, I have a lot of, sort of, articles and exhibits
03:56:53 10 that show I think what I just said. But there's also a -- you
03:56:58 11 know, what I would call almost a common sense intuition that
03:57:02 12 really can explain the problem with the government's four-step
03:57:07 13 fraudulent scheme.

03:57:09 14 Q. Please do.

03:57:11 15 A. Yeah. So, you know, just to take the simplest example of
03:57:17 16 what the government refers to as a trader, whether it's Mr.
03:57:24 17 Pacilio or anybody else, placing a large visible order in the
03:57:32 18 market, and I think the expression is shocking the market by
03:57:38 19 the size of the visible order. And the government claims in
03:57:44 20 this four-step scheme that the result of placing the large
03:57:52 21 visible order into the market is that other traders will look
03:57:59 22 at the large visible order, and they will sit -- they will
03:58:04 23 think that this trader knows something. So, for example, if
03:58:09 24 the large visible order is a buy order, they will think that
03:58:12 25 prices are going up and they will react by whatever price the

03:58:17 1 large visible order was at, they will start to bid up the
03:58:22 2 price even higher because they think the price is going up.
03:58:26 3 They will trade on the same side of the market.
03:58:29 4 And as a result of that, in this alleged scheme,
03:58:34 5 because the other traders will trade on the same side of the
03:58:39 6 market, the prices will rise and eventually, according to the
03:58:45 7 government, the iceberg will be executed.
03:58:50 8 But is that logical? I mean, does that make sense?
03:58:53 9 MR. ARMSTRONG: Objection, your Honor. Narrative.
03:58:58 10 THE COURT: Can we have a sidebar.
03:59:09 11 (Proceedings had at sidebar:)
03:59:09 12 THE COURT: All right. So, so far I've been pretty
03:59:12 13 lenient on who can formally object or lodge objections to
03:59:19 14 witness testimony. Who is going to cross Dr. Fischel?
03:59:24 15 MR. ARMSTRONG: I am, your Honor.
03:59:25 16 THE COURT: You are?
03:59:25 17 MR. ARMSTRONG: Yes.
03:59:26 18 THE COURT: Okay.
03:59:26 19 So, then, Mr. Armstrong, I anticipate that you will
03:59:31 20 be the exclusive person on behalf of the government who will
03:59:34 21 be objecting during the direct.
03:59:36 22 MR. ARMSTRONG: Perfect.
03:59:45 23 (Proceedings had in open court:)
03:59:45 24 THE COURT: Overruled.
03:59:45 25 BY MR. MENCHEL:

03:59:46 1 Q. I think where we were, Professor, was you were posing the
03:59:50 2 question is it logical to make that inference?

03:59:53 3 A. Yes. And what I'm going to demonstrate is that it's not
03:59:55 4 logical. And here's the reason: That while some traders may
03:59:58 5 behave that way -- in other words, some traders may say this
04:00:04 6 large visible order makes me think that prices are going up so
04:00:09 7 I'm going to also be a buyer at increasing prices, but is that
04:00:17 8 the only possible reaction the way the government's scheme
04:00:20 9 suggests? That the only way that traders will interpret the
04:00:25 10 large order is to trade in the same direction, and if it's a
04:00:29 11 buy order to continue to make offers to -- enter orders at
04:00:37 12 higher prices?

04:00:39 13 Isn't it possible that there's also potential sellers
04:00:44 14 in the market; and when they see all of a sudden a large
04:00:49 15 visible order to buy, that they now think they now have a
04:00:54 16 selling opportunity that didn't exist before because there's
04:00:58 17 this now new large buy order so people will trade on the
04:01:03 18 opposite side of the market, not on the same side of the
04:01:06 19 market?

04:01:07 20 And that's exactly what is not considered in the
04:01:11 21 government's four-part scheme.

04:01:14 22 Or how about another possibility? People -- traders
04:01:18 23 see all of a sudden a large visible buy order that didn't
04:01:24 24 exist before, and they think to themselves, I don't know
04:01:27 25 what's going on. You know, this is different. It shakes up

04:01:30 1 the market. And even if I was thinking I wanted to trade
04:01:35 2 before or enter an order before, now I'm not so sure. I can't
04:01:40 3 read the signals. Is this somebody who knows something and,
04:01:45 4 therefore, I should be buying, or is this an opportunity to
04:01:49 5 sell so I should be selling? Or maybe I can't figure it out
04:01:52 6 so I just want to sit on the sidelines and wait.

04:01:57 7 And what I'm going to demonstrate is that if you look
04:02:02 8 at the economic literature on trading behavior, as well as if
04:02:06 9 you look at what I would call a non-biased -- a representative
04:02:13 10 sample of Mr. Pacilio's trades, it's characteristic of all
04:02:18 11 those things. Sometimes traders will trade in the same
04:02:24 12 direction and increase the price if it's a buy or lower the
04:02:27 13 price if it's a sell. But sometimes the opposite will occur.
04:02:31 14 Sometimes the visible orders will execute because sellers now
04:02:38 15 see new opportunities to sell that didn't exist before, and
04:02:42 16 they come into the market and, therefore, in contrast with the
04:02:47 17 government's four-part scheme where none of the visible orders
04:02:53 18 result in sales and, therefore, none of the visible orders get
04:02:59 19 executed. It turns out a lot of visible orders get executed
04:03:04 20 opposite icebergs. And we'll see that in the data. We'll see
04:03:09 21 that in the economic literature about trading behavior.

04:03:13 22 And, again, sometimes nothing happens. Sometimes the
04:03:16 23 icebergs don't get hit. Sometimes the visible orders get
04:03:20 24 canceled and the icebergs get canceled. So, in other words,
04:03:25 25 there is a rich set of different possible reactions to a

04:03:30 1 trade. Traders will interpret the actions of placing a large
04:03:38 2 visible order that didn't exist before in different ways.
04:03:43 3 Some people will want to buy at higher prices. Some people
04:03:46 4 will want to sell, take advantage of the opportunity to sell.
04:03:51 5 Others won't want to do anything. They just won't understand
04:03:54 6 what's going on. They'll want to sit on the sidelines.

04:03:57 7 But if you go back and look at the government's
04:04:00 8 four-part scheme, it only has one of those alternatives. And
04:04:05 9 the government says that that one alternative happens every
04:04:08 10 time like clockwork. And that is false. That is a
04:04:13 11 misrepresentation of the relevant trading data. That is a
04:04:16 12 misrepresentation of the academic literature on trading
04:04:20 13 behavior. And it's certainly a misrepresentation of the
04:04:24 14 experience of what happens in the market over the period that
04:04:31 15 I've investigated when Mr. Pacilio places a large visible
04:04:36 16 order opposite an iceberg. And there's a lot of --

04:04:42 17 THE COURT: Actually, Dr. Fischel, let's let
04:04:45 18 Mr. Menchel ask you some questions.

04:04:46 19 THE WITNESS: I apologize, your Honor.

04:04:48 20 MR. MENCHEL: It has been a long day already.

04:04:49 21 THE WITNESS: Right. I apologize.

04:04:51 22 MR. MENCHEL: That's all right.

23 BY MR. MENCHEL:

04:04:52 24 Q. So, you mentioned academic literature a moment ago that
04:04:55 25 supports the idea that traders can react in a variety of ways;

04:04:57 1 is that right?

04:04:58 2 A. That's right.

04:04:58 3 Q. Okay.

04:04:59 4 I want to show you for your eyes only at this point
04:05:02 5 Defense Exhibit 147.

04:05:09 6 Do you recognize this?

04:05:09 7 A. I do.

04:05:10 8 Q. What is it?

04:05:11 9 A. Well, it's an article on trading behavior and different
04:05:17 10 types of traders published in the Journal of Financial
04:05:21 11 Economics.

04:05:22 12 Q. And what is the Journal of Financial Economics?

04:05:25 13 A. It's a very well-recognized leading journal on the subject
04:05:31 14 of financial economics.

04:05:34 15 Q. Is it what's referred to as a peer-reviewed journal?

04:05:37 16 A. Oh, very much so.

04:05:37 17 Q. Can you explain to the members of the jury who might not
04:05:39 18 be familiar with that term what peer-reviewed means?

04:05:42 19 A. Peer-reviewed -- for a journal like this, in order to get
04:05:46 20 an article published, the article is -- before it's published
04:05:57 21 is distributed to other experts in the field who have to --
04:06:01 22 whether they agree with the article or not, they have to
04:06:05 23 express an opinion that the article is of a sufficiently high
04:06:12 24 professional quality to be suitable for publication.

04:06:17 25 Q. And is this one of the articles that was relevant to your

04:06:20 1 opinion in this case?

04:06:21 2 A. Yes, very much so.

04:06:23 3 MR. MENCHEL: Your Honor, I'd ask that it be

04:06:24 4 published for demonstrative purposes only under Rule 703.

04:06:28 5 MR. ARMSTRONG: Objection.

04:06:32 6 THE COURT: Is there a particular site or particular

04:06:34 7 paragraph that you want to --

04:06:36 8 MR. MENCHEL: Yeah, there's several. Do you want me

04:06:38 9 to tell you what those are? Okay.

04:06:40 10 The first one, your Honor, is on Page 364, Section

04:06:43 11 2.2.

04:06:45 12 Abbie, if you could blow that up for the Court.

04:07:09 13 Your Honor, that goes to the next page. Let me know

04:07:15 14 when you want to do that.

04:07:18 15 THE COURT: All right.

04:07:19 16 So, Mr. Armstrong, let's talk about that.

04:07:33 17 (Proceedings had at sidebar:)

04:07:33 18 THE COURT: What is the basis for the objection?

04:07:35 19 MR. ARMSTRONG: Your Honor, this is displaying rank

04:07:37 20 hearsay before the jury in the form of a demonstrative. If

04:07:43 21 I'm wrong and that's permissible, I'm sure your Honor will

04:07:48 22 correct me, but I don't think I am.

04:07:50 23 MR. MENCHEL: With respect, I believe Mr. Armstrong

04:07:53 24 is wrong. Rule 703, basis of an expert's opinion. An expert

04:07:59 25 may base an opinion on facts or data in a case that the expert

04:08:03 1 has been made aware of or personally observed. If the
04:08:07 2 expert's in a particular field would reasonably rely on those
04:08:10 3 kind of fact or data in forming an opinion on the subject,
04:08:14 4 they may not be admissible for the opinion to be admitted.
04:08:18 5 But if the facts or data would otherwise be inadmissible, the
04:08:21 6 proponent of the opinion may disclose them to the jury only if
04:08:25 7 their probative value in helping the jury evaluate the opinion
04:08:28 8 substantially outweighs their prejudicial effect.

04:08:30 9 This is an article that speaks to the three ways in
04:08:34 10 which traders react to large visible orders, exactly as
04:08:38 11 Professor Fischel described: Passive, aggressive, defensive.

04:08:46 12 THE COURT: Objection is overruled.

04:09:02 13 (Proceedings had in open court:)

04:09:03 14 MR. MENCHEL: Can we go back to the first page,
04:09:05 15 please.

04:09:08 16 Your Honor, may we publish.

04:09:10 17 THE COURT: It is.

04:09:11 18 MR. MENCHEL: Thank you.

19 BY MR. MENCHEL:

04:09:12 20 Q. Professor, what is the name of this article, please?

04:09:16 21 A. The title of the article is "Hidden Liquidity: An
04:09:20 22 Analysis of Order Exposure Strategies in Electronic Stock
04:09:25 23 Markets."

04:09:26 24 Q. And it's a pretty technical article with a lot of data,
04:09:29 25 stats?

04:09:30 1 A. Correct, it is.

04:09:31 2 Q. But in a nutshell, what is this article addressing in its
04:09:34 3 research?

04:09:35 4 A. It's addressing the different types of traders who react
04:09:43 5 to the presentation of new orders in the marketplace.

04:09:49 6 Q. Okay.

04:09:50 7 And let's go to a couple of sections that -- I think
04:09:55 8 you identified as being relevant to your opinion; is that
04:09:58 9 right?

04:09:58 10 A. That's correct.

04:09:58 11 Q. If we can go to Page 364, please, under section 2.2.

04:10:16 12 Can you read to us what this says and then explain it
04:10:18 13 in perhaps better layman's English?

04:10:24 14 A. Okay. It's talking about a previous contribution by
04:10:30 15 Harris. And the article states Harris has articulated some
04:10:37 16 important economic reasoning relevant to understanding hidden
04:10:42 17 order usage. He observes that some traders follow a passive
04:10:47 18 strategy where they wait for other traders to indicate their
04:10:50 19 interest in trading on favorable terms. The presence of these
04:10:53 20 passive or reactive traders increases the attractiveness of
04:10:59 21 publicly displaying one's interest in trading, in order to
04:11:03 22 draw out the passive traders.

04:11:05 23 Q. Stop right there.

04:11:06 24 So, in more regular English, what does that mean?

04:11:09 25 A. That means exactly what I was describing a minute ago.

04:11:14 1 That when -- one of the purposes of, according to this
04:11:21 2 article, of placing a new large order in the marketplace on
04:11:27 3 one side of the market, it attracts reactive traders to trade
04:11:35 4 on the other side of the market where they were waiting for
04:11:39 5 the opportunity to do so.

04:11:41 6 So, in other words, if there's a large buy order
04:11:45 7 that's placed in the market, some traders who are interested
04:11:48 8 in selling who are sitting on the side lines waiting for the
04:11:56 9 opportunity to sell now see an opportunity that didn't exist
04:11:58 10 before. So they come into the market with sell orders in
04:12:03 11 order to execute with the buy order.

04:12:08 12 Q. If we can continue, please, where it says other traders in
04:12:11 13 contrast?

04:12:11 14 A. Okay.

04:12:13 15 "Other traders in contrast follow what Harris calls
04:12:17 16 defensive and pair sit I can strategies. Pair sit I can
04:12:22 17 traders seek to exploit the existence of large buy orders by
04:12:26 18 front running the order or by using order matching strategies,
04:12:31 19 by posting a limit order at a price one tick more favorable
04:12:35 20 than the existing order."

04:12:39 21 Q. Again, can you explain to us what that means when the term
04:12:42 22 defensive or pair sit I can is used, what does that mean in
04:12:45 23 terms of when someone places a large buy order on one side of
04:12:48 24 the market?

04:12:48 25 A. That, again, the possibility that's the focus in the

04:12:54 1 government's four-step fraudulent scheme, that other traders
04:13:01 2 look at the large order and think that this person is placing
04:13:06 3 a large order because they know something about the way that
04:13:09 4 the market is going to move. And, so, they trade in the same
04:13:13 5 direction as stated in the article. They post limit orders at
04:13:19 6 a price one tick more favorable than the existing order. In
04:13:25 7 other words, they trade in the same direction, but they either
04:13:30 8 improve the bid by offering to pay more or improve the ask by
04:13:39 9 willing to sell for less.

04:13:42 10 Q. There's a reference here that a pair sit I can trader as
04:13:45 11 defined by Harris is doing something called front running.
04:13:49 12 What does that mean?

04:13:50 13 A. Front running in this context is means that it's the
04:13:56 14 ability if let's say the existing order is to buy at 10, to
04:14:04 15 immediately enter an order, as the article states, one tick
04:14:08 16 higher, to buy at 10.10, in order to base deal knockout the
04:14:17 17 existing order by offering a slightly better price, front
04:14:20 18 running above the existing order in order to take advantage of
04:14:27 19 the belief that prices are going to be rising.

04:14:30 20 Q. Then I want to direct your attention to the sentence that
04:14:34 21 begins with?

04:14:40 22 MR. MENCHEL: Can you clean this, Abbie.

04:14:45 23 Just the highlighting, please.

04:14:46 24 Can you start off where it shows the word or. Let me
04:14:49 25 see if I can help you out.

04:14:50 1 THE WITNESS: Right.

04:14:51 2 MR. MENCHEL: Can you highlight that, please, and go
04:14:54 3 to the next page, as well, Abbie. It might have to be a side
04:14:57 4 by side.

5 BY MR. MENCHEL:

04:15:04 6 Q. Can you read that section, please?

04:15:05 7 A. Yes.

04:15:06 8 "Or in those cases where the display of trading
04:15:09 9 interest, the posting of a large buy limit order, conveys that
04:15:13 10 the limit order trader may possess positive private
04:15:17 11 information regarding security value, defensive traders may
04:15:22 12 react by ceasing to submit -- "

04:15:24 13 Q. Hold on one second.

04:15:27 14 MR. MENCHEL: Do you have it on the screen?

04:15:30 15 Thank you.

16 BY THE WITNESS:

04:15:32 17 A. Should I continue?

04:15:33 18 BY MR. MENCHEL:

04:15:33 19 Q. Yes, please.

04:15:34 20 A. " -- by ceasing to submit market sell orders or cancelling
04:15:37 21 existing limit sell orders."

04:15:40 22 Q. Okay.

04:15:40 23 So, what type of trader is that?

04:15:42 24 A. That's the kind of trader who, again, is unsure what the
04:15:49 25 order represents and, therefore, that trader, referred to here

04:15:57 1 as a defensive trader, as is stated, may react by ceasing to
04:16:02 2 submit orders or cancelling orders that they've submitted.

04:16:06 3 In other words, this description in more -- if you
04:16:10 4 want to say more technical terms, because it's a technical
04:16:14 5 article, is exactly the three different strategies that I
04:16:17 6 mentioned earlier.

04:16:19 7 Q. So, let me just make sure we understand.

04:16:23 8 The article mentions a reactive trader?

04:16:25 9 A. Correct.

04:16:26 10 Q. That's the person who will actually go and meet the large
04:16:31 11 order by -- if it's a buy, by selling?

04:16:33 12 A. Correct.

04:16:34 13 Q. We have the parasitic trader. That's the trader who will
04:16:40 14 front run the large order by getting ahead of that order?

04:16:43 15 A. Exactly.

04:16:43 16 Q. And we have the defensive trader who may just get out of
04:16:45 17 the market altogether?

04:16:46 18 A. Exactly.

04:16:47 19 Q. Okay.

04:16:50 20 MR. MENCHEL: If we could, please, let's go to Page
04:16:54 21 365 starting -- can you blow up the paragraph, please, Abbie,
04:17:06 22 that starts limit orders -- "limit order traders can draw
04:17:09 23 reactive traders." Just that paragraph, please.

24 BY MR. MENCHEL:

04:17:13 25 Q. Professor, can you read to us what is being said in this

04:17:16 1 paragraph.

04:17:18 2 A. All right. Well, it's a long paragraph, but there's
04:17:20 3 several things that I think are particularly worthwhile to
04:17:24 4 focus on.

04:17:26 5 First of all, the first sentence: "Limit order
04:17:29 6 traders can draw reactive traders -- " namely, traders to
04:17:34 7 trade on the opposite side of the market "-- either by posting
04:17:37 8 an attractive price or by exposing order size."

04:17:41 9 Q. Let me stop you there.

04:17:42 10 So, an attractive price would mean somebody -- if
04:17:46 11 we're at the best bid and the best offer, what would be an
04:17:51 12 attractive price for a bid?

04:17:52 13 A. A price that's closer to the price that they want to
04:17:55 14 transact at.

04:17:56 15 Q. So, in other words --

16 A. So --

04:17:57 17 Q. -- if the current --

04:17:57 18 A. -- improvement on the best bid or the best ask.

04:18:00 19 Q. So, in other words, if the best bid was 9 and the trader
04:18:04 20 puts in 9.10, one way they're going to attract a reaction for
04:18:07 21 people to sell is you've now improved the price for them?

04:18:11 22 A. Correct.

04:18:11 23 Q. Okay.

04:18:11 24 And what about the second piece about exposing order
04:18:15 25 size?

04:18:15 1 A. Yes. And, again, let's say there's a trader that wants to
04:18:24 2 sell a large number of contracts but doesn't see an
04:18:32 3 opportunity to do that, but if all of a sudden a new buy order
04:18:37 4 that's large comes into the market, that creates a selling
04:18:45 5 opportunity just because of the number of contracts that are
04:18:52 6 available to -- well, buy or sell depending on which side the
04:18:58 7 trader on the opposite side of the market is that didn't exist
04:19:03 8 before.

04:19:05 9 So, that trader who is on the sidelines waiting for
04:19:09 10 an opportunity to, let's say, sell a large number of
04:19:16 11 contracts, if all of a sudden there's a new buy order for a
04:19:20 12 large number of contracts, again, that's an opportunity that
04:19:23 13 didn't exist before, just like a better price is an
04:19:26 14 opportunity that didn't exist before.

04:19:28 15 Q. Okay.

04:19:29 16 A. And that can draw traders into the market that wouldn't
04:19:33 17 otherwise be into the market. Those are the reactive traders.

04:19:37 18 Q. Okay.

04:19:37 19 I want to direct your attention to the sentence that
04:19:41 20 begins "large, aggressively priced orders are, therefore,
04:19:47 21 likely to be perceived as originating from informed traders."

04:19:50 22 Can you read that, please.

04:19:51 23 A. Yes.

04:19:52 24 "Large, aggressively priced orders are, therefore,
04:19:54 25 likely to be perceived as originating from informed traders,

04:19:57 1 which can cause defensive traders to exit the market or
04:20:01 2 parasitic traders to indulge in front running strategies."

04:20:05 3 Q. And that's what we discussed earlier, right?

04:20:07 4 A. Yes. Those are the two other strategies that we discussed
04:20:10 5 earlier.

04:20:10 6 Q. Okay.

04:20:21 7 So, I want to, just finally on this article, direct
04:20:24 8 your attention to Page 369 under what's called Paragraph 4.
04:20:33 9 And I'm just going to direct your attention to one part of it
04:20:36 10 so we can move a little bit more quickly.

04:20:51 11 MR. MENCHEL: It's hard for me to see on this screen.

04:20:54 12 Do you see, Abbie, where it says "the latter
04:20:56 13 reasoning suggests" in this paragraph right here?

04:21:01 14 BY MR. MENCHEL:

04:21:03 15 Q. Professor, you see where it says "the latter reasoning
04:21:06 16 suggests"?

04:21:07 17 A. Yes, I do.

04:21:07 18 Q. Can you read that, please.

04:21:09 19 A. "The latter reasoning suggests that exposing an order can
04:21:13 20 increase the likelihood of order execution."

04:21:17 21 Q. Let me stop you right there.

04:21:19 22 What does that mean?

04:21:20 23 A. That means that the finding of this article is that
04:21:28 24 placing a visible order exposing an order, meaning it's a
04:21:33 25 visible order, can increase the likelihood that that visible

04:21:38 1 order will execute as opposed to being canceled.

04:21:42 2 Q. So, in your opinion, are the government's claims
04:21:50 3 concerning the trading behavior consistent with this published
04:21:52 4 article?

04:21:54 5 A. No.

04:21:54 6 Q. Why not, briefly?

04:21:56 7 A. Briefly, because the government's four-step alleged
04:22:02 8 fraudulent scheme only takes into account one of the possible
04:22:08 9 reactions of traders in the marketplace and ignores the other
04:22:13 10 two. And for that reason, the government's alleged scheme is
04:22:20 11 fundamentally inconsistent and contradicted by the academic
04:22:25 12 research on trading behavior.

04:22:28 13 MR. MENCHEL: Take that down. Thank you, Abbie.

14 BY MR. MENCHEL:

04:22:30 15 Q. Professor, are you familiar with the term "aggressive
04:22:33 16 order"?

04:22:33 17 A. I am.

04:22:33 18 Q. Can you please explain to the members of the jury, please,
04:22:36 19 what an aggressive order is?

04:22:37 20 A. An aggressive order is a marketable order which by
04:22:45 21 definition executes immediately in whole or in part.

04:22:50 22 Q. Is that because it crosses the bid-ask spread?

04:22:53 23 A. Yes, it crosses the spread. If it's a buy order, it
04:22:56 24 crosses the spread to the best ask, and the reverse if it's a
04:23:02 25 sell order.

04:23:03 1 Q. So, in other words, if the best bid is 9 and the best
04:23:07 2 offer is 10, an aggressive order would be a bidder going to
04:23:10 3 10?

04:23:10 4 A. Correct.

04:23:11 5 Q. Now, can an aggressive order have both aggressive
04:23:14 6 executions and non-aggressive executions?

04:23:17 7 A. Yes, that frequently occurs.

04:23:20 8 Q. Can you explain that, please. I'm sorry, with an example
04:23:28 9 might be helpful?

04:23:29 10 A. Yeah.

04:23:31 11 So, let's say a trader places an aggressive order to
04:23:37 12 purchase a hundred contracts at 10 -- again, just to make up a
04:23:43 13 number -- but it turns out that there's only 50 contracts that
04:23:50 14 are available for sale at 10. So, the aggressive order
04:23:57 15 will -- because it crosses the spread, will -- execute for the
04:24:05 16 50 contracts that are available for sale at 10.

04:24:11 17 But the other 50 contracts of the aggressive order,
04:24:17 18 there aren't contracts available to execute at that price.
04:24:22 19 So, the leftover contracts that are not immediately executed
04:24:28 20 become, in effect, resting orders.

04:24:30 21 Q. Is that relevant to your analysis?

04:24:33 22 A. It is relevant because, again, you know, I would consider
04:24:39 23 it a way to test the consistency of the four -step government
04:24:47 24 scheme -- alleged fraudulent scheme -- that's supposed to work
04:24:51 25 like clockwork with actual trading behavior.

04:24:54 1 Q. Okay.

04:24:55 2 Now, have you in this case analyzed what the
04:24:59 3 government has referred to as large visible orders that Mr.
04:25:02 4 Pacilio placed?

04:25:03 5 A. Yes. I've analyzed that quite extensively.

04:25:07 6 Q. And I want to show you just for your eyes only at this
04:25:09 7 point Defense Exhibits 188 and 317.

04:25:21 8 MR. MENCHEL: If you can do a side by side, please,
04:25:23 9 Abbie.

10 BY MR. MENCHEL:

04:25:33 11 Q. Professor, do you recognize what is displayed in
04:25:36 12 Defendants' Exhibits 188 and 317?

04:25:41 13 A. Yes, I do.

04:25:42 14 Q. What is it? What are they, I should say?

04:25:44 15 A. Well, if it's possible to -- it's a little bit hard to --

04:25:53 16 Q. Do you have a binder?

04:25:54 17 A. Yeah. Maybe I'll look at the binder.

04:25:56 18 MR. MENCHEL: With the Court's permission, may he
04:25:58 19 look at the binder that contains the same exhibit?

04:26:00 20 THE COURT: That's fine.

21 BY THE WITNESS:

04:26:02 22 A. So, one is -- Exhibit 188 is an analysis of Mr. Pacilio's
04:26:10 23 resting non-iceberg limit orders in the top five levels.
04:26:16 24 That's one of them.

04:26:17 25 And the other, Exhibit 317, is an analysis of Mr.

04:26:23 1 Pacilio's aggressive, non-iceberg limit orders.

04:26:30 2 MR. MENCHEL: Okay. I would offer those, your Honor.

04:26:31 3 THE COURT: Any objection?

04:26:34 4 MR. ARMSTRONG: No objection.

04:26:36 5 THE COURT: Defendants' Exhibit 188 and 317 are
04:26:40 6 admitted in evidence.

7 (Government Exhibit Nos. 188 and 317 received in
04:26:46 8 evidence.)

04:26:46 9 MR. MENCHEL: Publish, please, your Honor.

04:26:47 10 Thank you.

11 BY MR. MENCHEL:

04:26:49 12 Q. There's a lot of numbers on these charts, right?

04:26:51 13 A. Yes.

04:26:51 14 Q. Okay.

04:26:51 15 Have you also created graphical depictions of the
04:26:54 16 data that are displayed in Defendants' Exhibits 188 and 317?

04:26:58 17 A. Yes.

04:26:58 18 Q. I want to show you what has been marked --

04:27:04 19 MR. MENCHEL: You can take that off the screen.

04:27:06 20 Thank you, Abbie.

21 BY MR. MENCHEL:

04:27:08 22 Q. -- for your eyes only, please, Defense Exhibit 813 and
04:27:11 23 Defense Exhibit 812.

04:27:34 24 MR. MENCHEL: Wrong one.

04:27:34 25 Your Honor, I know this is a long day. Any chance we

04:27:36 1 could have a standing break at this moment, a little stretch
04:27:39 2 break?

04:27:39 3 THE COURT: That's fine.

04:27:40 4 Let's go ahead and just stand up and stretch a little
04:27:44 5 bit.

04:29:18 6 (Brief pause.)

7 BY MR. MENCHEL:

04:29:19 8 Q. Now, Professor, are Defendants' Exhibits 813 and 812
04:29:23 9 graphical depictions of those numerical charts that were
04:29:26 10 Defense Exhibit 188 and 317, respectively?

04:29:28 11 A. Yes.

04:29:29 12 MR. MENCHEL: I would offer them, your Honor.

04:29:31 13 THE COURT: Any objection?

04:29:32 14 MR. ARMSTRONG: Sure. No objection.

04:29:34 15 THE COURT: Defendants' Exhibits 113 -- I'm sorry,
04:29:37 16 813 and 812 are admitted in evidence.

17 (Government Exhibit Nos. 812 and 813 received in
04:29:40 18 evidence.)

04:29:40 19 MR. MENCHEL: If we could start first, please, Abbie
04:29:43 20 with 813.

04:29:45 21 And, your Honor, could you publish, please?

04:29:51 22 THE COURT: Go ahead.

04:29:52 23 MR. MENCHEL: I'm sorry?

04:29:55 24 THE COURT: It's published.

04:29:57 25 MR. MENCHEL: Oh, okay. I thought you said something

04:29:59 1 else. It's a long day.

2 BY MR. MENCHEL:

04:30:01 3 Q. Can you explain to the members of the jury, please, what

04:30:03 4 is depicted in Defense Exhibit 813?

04:30:06 5 A. This is a bar chart that depicts the execution speed for

04:30:19 6 Mr. Pacilio's aggressive, non-iceberg, large and group orders

04:30:26 7 from the period March 23rd, 2009, through October 29th, 2014.

04:30:34 8 Q. Now, I just want to ask you because you're using the word

04:30:38 9 "large and group orders." Is that a term that the government

04:30:43 10 used in its graphical depictions in this case?

04:30:48 11 A. Yes, and that's why I chose it.

04:30:50 12 Q. And do they match in terms of the size of what is

04:30:52 13 considered large, what's considered a group, both for the gold

04:30:55 14 and silver markets?

04:30:57 15 A. Yes.

04:30:57 16 Q. Can you then explain to us what this graph depicts?

04:31:01 17 A. Well, it depicts several things. First of all, it depicts

04:31:08 18 executions for non-iceberg large and group orders. And, you

04:31:18 19 know, for gold, you can see that there are 12,114 executions;

04:31:25 20 and for silver, 3,819 executions.

04:31:32 21 Another --

04:31:32 22 Q. Let me stop you, Professor, so that everyone understands.

04:31:35 23 So, these are all of Mr. Pacilio's aggressive, large

04:31:39 24 iceberg -- I'm sorry, non-iceberg orders that fit the

04:31:43 25 government's definition of what large or group is for the

04:31:46 1 entire period of March 2009 to October 2014?

04:31:51 2 A. Correct.

04:31:51 3 Q. Okay.

04:31:52 4 And, so, for gold, counting up -- you looked at all
04:31:56 5 of them -- there's 12,114 executions that occurred?

04:31:59 6 A. That's correct.

04:32:00 7 Q. For silver, 3,819 executions?

04:32:03 8 A. That's right.

04:32:04 9 Q. Okay.

04:32:04 10 What's the next thing that this depicts?

04:32:07 11 A. The next thing that it depicts is how fast, how -- the
04:32:14 12 executions occurred. And, so, as I said, a minute ago, the
04:32:22 13 aggressive non-iceberg large and group orders, they execute
04:32:29 14 immediately because they cross the spread. That's a
04:32:32 15 marketable order that crosses the spread. And, so, that's
04:32:37 16 immediate execution.

04:32:38 17 Q. And let me just stop you.

04:32:39 18 Is that what's depicted in green in both of these bar
04:32:43 19 graphs for the gold and silver markets?

04:32:44 20 A. Correct.

04:32:45 21 Q. All right.

04:32:46 22 So, the green shading shows a large order has crossed
04:32:49 23 the spread, and this shows, what? What does the green show?

04:32:53 24 A. It shows that it executes immediately. And that's the
04:32:59 25 definition of what the type of order is. That's what an

04:33:03 1 aggressive order means. So, it executes instantly.

04:33:10 2 Q. Okay.

04:33:10 3 And, then, what does the blue bar in each of these
04:33:13 4 show?

04:33:13 5 A. Yeah, the blue bar, if you look at the legend on the
04:33:17 6 bottom, the blue bar is executions that occur in less than
04:33:26 7 half a second.

04:33:29 8 Q. Okay.

04:33:29 9 And for the gold market, what are we seeing depicted
04:33:34 10 by the blue bar for all of Mr. Pacilio's aggressive large and
04:33:39 11 group orders?

04:33:40 12 A. Well, it looks like a little bit less than half of Mr.
04:33:50 13 Pacilio's aggressive, non-iceberg large and group orders
04:33:59 14 executed within less than half a second. Again, these are, in
04:34:06 15 effect, the parts of the aggressive orders that did not
04:34:11 16 execute instantly. They're basically the leftover part that I
04:34:15 17 described in my example earlier.

04:34:18 18 Q. Okay.

04:34:19 19 And for the silver?

04:34:21 20 So, this -- let me interrupt you.

04:34:22 21 So, these are all the executions that, once the large
04:34:25 22 orders just sitting there, are executed in half a second or
04:34:29 23 less?

04:34:30 24 A. Right.

04:34:31 25 And the other thing that's significant about that is

04:34:35 1 not just the speed of execution, but in order for those
04:34:45 2 orders -- excuse me, for those contracts -- to execute, they
04:34:52 3 have to be basically hit by traders on the opposite side of
04:34:58 4 the market, not on the same side of the market, as in the
04:35:03 5 government's four-part -- four-step fraudulent scheme. On the
04:35:09 6 opposite side of the market.

04:35:10 7 In other words, all the contracts that execute above
04:35:17 8 green, under the logic of the government's four-step
04:35:22 9 fraudulent scheme, should never execute because these are --
04:35:27 10 if the aggressive order shocks the market, then the only
04:35:36 11 contracts that should -- the only response from traders should
04:35:41 12 be to keep trading on the same side of the market, the front
04:35:46 13 running strategy.

04:35:47 14 But all of these executions that are in blue and
04:35:51 15 above blue only occur because those are resting orders that
04:35:56 16 are then hit by traders on the opposite side of the market.
04:36:02 17 Again, what's completely left out of the government's
04:36:06 18 four-step fraudulent scheme.

04:36:08 19 Q. Okay.

04:36:08 20 Now, in the blue bar then, who's ever hitting these
04:36:15 21 orders has to be able to do so with the ability to trade in
04:36:18 22 less than half a second; is that right?

04:36:20 23 A. That's right.

04:36:20 24 Q. Okay.

04:36:21 25 And, then, what does the remaining bars show, very

04:36:25 1 quickly, please?

04:36:26 2 A. Just executions within either half a second to one second

04:36:37 3 or one to five seconds or executions greater -- that occur in

04:36:42 4 a period greater than five seconds.

04:36:44 5 Q. Okay.

04:36:46 6 MR. MENCHEL: Abbie, can you put that down, please,

04:36:48 7 and can you go to Defense Exhibit 812 now in evidence.

8 BY MR. MENCHEL:

04:37:02 9 Q. Now, how is this Defendants' Exhibit 812 different than

04:37:07 10 the last exhibit we just looked at? Because it looks awfully

04:37:11 11 similar.

04:37:11 12 A. It's different because these are not aggressive -- this is

04:37:16 13 an exhibit not dealing with aggressive orders but just with

04:37:21 14 resting -- large, resting, non-iceberg orders.

04:37:25 15 Q. Okay.

04:37:26 16 So, in the government's case where we saw all those

04:37:29 17 Episodes 1 through 72, this is the scenario where a large

04:37:34 18 resting order is placed into the market; is that right?

04:37:37 19 A. That's right.

04:37:37 20 Q. Okay.

04:37:38 21 And, again, have you looked at all of the executions

04:37:42 22 that occurred from March 2009 to October 2014?

04:37:46 23 A. That's right.

04:37:46 24 Q. Okay.

04:37:47 25 And what does the data show?

04:37:49 1 A. It shows that, again, it's quite similar for the blue; is
04:37:57 2 executions that occurred in less than half a second. That
04:38:01 3 looks, you know, for both gold and silver approximately 40
04:38:05 4 percent of the executions occurred less than half a second.

04:38:10 5 And, then, the other colors are executions at
04:38:17 6 different times, as indicated by the legend at the bottom.
04:38:21 7 Basically, the same legend as we just looked at for the
04:38:25 8 aggressive orders.

04:38:32 9 Q. Now, the government has claimed that cancelling an order
04:38:45 10 soon after it was placed by Mr. Pacilio is not consistent with
04:38:49 11 an intent to execute that. In other words, it's placed so
04:38:51 12 fast, canceled so fast, that suggests he never intended it to
04:38:55 13 execute in the first place.

04:38:56 14 You understand that?

04:38:57 15 A. I do.

04:38:58 16 Q. Do you agree with that? The mere fact that an order by
04:39:01 17 Mr. Pacilio opposite an iceberg order is placed quickly and
04:39:05 18 canceled quickly -- I'm sorry, placed and canceled quickly --
04:39:08 19 is evidence that he did not intend for it to execute?

04:39:13 20 A. No, that's incorrect as an inference from that type of
04:39:19 21 trading action.

04:39:19 22 Q. Why is that?

04:39:20 23 A. Because as you can see, executions happen so quickly --
04:39:28 24 almost half the time in less than half a second -- that even
04:39:35 25 an order that's placed and canceled immediately, that might be

04:39:43 1 done really for two reasons. One is because you know that --
04:39:50 2 the trader knows that the executions can happen immediately,
04:39:55 3 instantly. That's one possibility.

04:39:59 4 And the other possibility, which is not mutually
04:40:02 5 exclusive, is that the cancellation protects the trader -- Mr.
04:40:09 6 Pacilio or any other trader -- from being exposed in the
04:40:14 7 market to risk in the event that the market moves in the wrong
04:40:21 8 direction.

04:40:21 9 Q. So, the jury's heard some terminology called a free
04:40:26 10 option. Are you familiar with that term?

04:40:27 11 A. Yes.

04:40:27 12 Q. And is that what you're referring to here?

04:40:29 13 A. Basically, yes.

04:40:30 14 Q. So, in other words, if Mr. Pacilio or anybody else places
04:40:35 15 a bid at 9 and he gets front run with somebody else coming in
04:40:40 16 at 9.10 and the price went -- so, that order is the one that's
04:40:45 17 going to execute if anyone's going to execute, right? The
04:40:47 18 better bid?

04:40:48 19 A. That's right.

04:40:48 20 Q. And if the trader that had the price at 9.10 thinks the
04:40:53 21 price may drop, what is the effect of Mr. Pacilio's order
04:40:58 22 still sitting in the market if it's just resting there?

04:41:00 23 A. The -- if the trader thinks the price is -- the front
04:41:07 24 running trader thinks the price is going to increase, they'll
04:41:09 25 benefit from the increase.

04:41:10 1 If they think the price is going to fall, they will
04:41:13 2 sell back to, in this case, Mr. Pacilio in the example at 9.

04:41:20 3 Q. So, he acts as an insurance policy for the person that
04:41:25 4 front run him?

04:41:26 5 MR. ARMSTRONG: Objection to form.

04:41:27 6 THE COURT: Sustained.

7 BY MR. MENCHEL:

04:41:29 8 Q. What, in essence, is the problem with keeping a large
04:41:31 9 resting order open once you've been front run?

04:41:35 10 A. The problem is you don't know which way the market is
04:41:37 11 going to move. So, either you lose the ability to get the
04:41:43 12 upside if the market moves in one direction. And if the
04:41:46 13 market moves in the wrong direction, in effect, you bear a lot
04:41:50 14 of the loss because the front running trader just sells back
04:41:54 15 to you at the resting order that's still there. And if you
04:42:01 16 cancel, you avoid that risk.

04:42:03 17 Q. So, is it economically rational for a trader who has been
04:42:08 18 front run to quickly cancel to avoid being the free option to
04:42:13 19 the front running trader?

04:42:14 20 A. Yes. I mean, the basic idea is you can cancel at the --
04:42:22 21 very quickly at the time you place an order and you still may
04:42:25 22 get a lot of executions just because of the speed of
04:42:28 23 executions where half the executions approx- -- little bit
04:42:33 24 less than half occur in less than half a second. And you also
04:42:37 25 avoid the risk of basically being taken advantage of by front

04:42:44 1 running traders who, again, get the benefit if the price moves
04:42:47 2 in one direction and you bear a lot of the loss if the price
04:42:50 3 moves in the other direction. And you can avoid that risk by
04:42:55 4 getting executions if they occur and cancelling to avoid the
04:43:01 5 possibility of being taken advantage of by front running
04:43:04 6 traders.

04:43:05 7 Q. So, is what's depicted in Defendants' Exhibit 812
04:43:10 8 instances where Mr. Pacilio placed a large visible order and
04:43:14 9 nonetheless got executions?

04:43:16 10 A. Yes, exactly. That's exactly what it depicts.

04:43:19 11 Q. Did you analyze the large and group orders placed by
04:43:29 12 traders other than Mr. Pacilio, Mr. Bases and Mr. Lakan?

04:43:33 13 A. Yes.

04:43:33 14 Q. I'd like to show you, for your eyes only, please, Defense
04:43:37 15 Exhibit 823.

04:43:44 16 And do you recognize this exhibit?

04:43:47 17 A. I do.

04:43:47 18 Q. What is it?

04:43:48 19 A. It's an analysis of large and group non-iceberg orders in
04:44:01 20 the top five levels for traders other than Mr. Pacilio, Mr.
04:44:08 21 Bases and Mr. Lakan on the dates of the government's episodes
04:44:18 22 1 through 50 involving Mr. Pacilio.

04:44:22 23 MR. MENCHEL: I would offer Defendants' Exhibit 823,
04:44:24 24 your Honor.

04:44:24 25 MR. ARMSTRONG: Your Honor, could we be heard on

04:44:26 1 this, please?

04:44:45 2 (Proceedings had at sidebar:)

04:44:45 3 MR. ARMSTRONG: Your Honor, this seems pretty far
04:44:50 4 afield and irrelevant to the trading patterns and the trading
04:44:54 5 activity of the defendants in this case. This opens the door
04:44:59 6 to a litany of issues about an untold number of other traders
04:45:03 7 performing untold strategies and unknown strategies that the
04:45:07 8 jury has no awareness of and has heard nothing about.

04:45:11 9 I think that the relevance and the probative value is
04:45:13 10 almost zero of this and substantially outweighed by the
04:45:18 11 confusion of the issues and the misleading effect that it's
04:45:21 12 going to have on the jury.

04:45:22 13 I fail to see how this proves one way or the other
04:45:25 14 the patterns that we saw in the activity of Mr. Bases and Mr.
04:45:31 15 Pacilio.

04:45:31 16 THE COURT: Mr. Menchel?

04:45:33 17 MR. MENCHEL: Your Honor, this exhibit shows, and in
04:45:37 18 the very same days that the government has chosen as episodes
04:45:39 19 that demonstrate Mr. Pacilio's attempt to spoof and shock the
04:45:43 20 market, there were other participants in the market behaving
04:45:47 21 in a very similar fashion, meaning placing large orders as
04:45:51 22 defined by the government and cancelling quickly and getting a
04:45:55 23 low fill ratio -- and getting low fill ratios.

04:45:59 24 The point of this chart is to show that when you
04:46:03 25 compare these traders to other traders in the market on the

04:46:06 1 same days, there's nothing unusual about their trading
04:46:08 2 pattern.

04:46:16 3 THE COURT: So, does that prove that Mr. Pacilio did
04:46:22 4 not spoof or does it prove that there were a bunch of other
04:46:25 5 traders spoofing?

04:46:26 6 MR. MENCHEL: Well, I think that's open to cross-
04:46:29 7 examination.

04:46:29 8 THE COURT: Objection sustained.

04:46:33 9 (Proceedings had in open court:)

10 BY MR. MENCHEL:

04:46:50 11 Q. Okay. Now, Professor, we're going to move on to the
04:46:52 12 government's trial episodes that were used in this case, okay?

04:46:57 13 A. Okay.

04:46:58 14 Q. Did you determine if there were other trading sequences
04:47:03 15 involving Mr. Pacilio besides the 50 trial episodes in which
04:47:07 16 large visible orders were placed opposite an iceberg order?

04:47:11 17 A. Yes, I did.

04:47:12 18 Q. I want to show you, for your eyes only, Defense Exhibit
04:47:15 19 319.

04:47:19 20 If you need to use the binder, Professor, you can do
04:47:22 21 that, as well.

04:47:25 22 A. Okay. I see it.

04:47:27 23 Q. Do you recognize it?

04:47:28 24 A. I do.

04:47:28 25 Q. What is it, please?

04:47:29 1 A. It's a set of the number of visible orders opposite
04:47:40 2 icebergs involving Mr. Pacilio from the period August 2008
04:47:48 3 through October 2014, where the episodes, again, involve the
04:47:56 4 government's criteria of large visible orders.

04:48:01 5 MR. MENCHEL: I would offer it, your Honor.

04:48:03 6 MR. ARMSTRONG: Your Honor, Court's indulgence.

04:48:06 7 There's a lot of information. If we can just digest it for
04:48:10 8 just two seconds.

04:48:11 9 THE COURT: Yes, go ahead.

04:48:21 10 (Brief pause.)

04:48:21 11 MR. ARMSTRONG: Your Honor, could we be heard on
04:48:23 12 this, please?

04:48:35 13 (Proceedings had at sidebar:)

04:48:35 14 THE COURT: Go ahead.

04:48:37 15 MR. ARMSTRONG: Your Honor, I have a very clear
04:48:40 16 recollection -- if I'm wrong, someone can correct me -- that
04:48:45 17 your Honor restricted the coordinated activities to just the
04:48:48 18 conspiracy period because we did not allege, and we're not
04:48:52 19 trying to prove, coordination outside that period. This seems
04:48:55 20 to go beyond that and go beyond what we're trying to prove and
04:49:00 21 the relevance of what we're trying to prove for the period of
04:49:03 22 coordination, which is that one-year period when all three
04:49:06 23 were at Bank of America.

04:49:12 24 It says in the first line that it involves a period
04:49:16 25 of 2008 to 2014, which obviously is expansive on both sides

04:49:24 1 dan not relevant at all to the period in which we allege the
04:49:27 2 conspiracy with coordinated activity.

04:49:44 3 THE COURT: Mr. Menchel, at this time, do you know
04:49:46 4 all the exhibits that you're going to use with Dr. Fischel?

04:49:51 5 MR. MENCHEL: Yes, and they've been disclosed.

04:49:54 6 MR. ARMSTRONG: Your Honor, we received about 200
04:49:56 7 exhibits over the last couple days. It's been a herculean
04:50:01 8 task.

04:50:02 9 MR. MENCHEL: That's not true. I specifically
04:50:03 10 disclosed the exhibits we were going to use with this witness
04:50:06 11 so that you knew exactly the curated amount he'll be using.

04:50:13 12 THE COURT: And how many is that? How many more?

04:50:17 13 MR. MENCHEL: Approximately ten.

14 (Proceedings had in open court:)

04:50:31 15 THE COURT: Ladies and gentlemen, we're going to
04:50:32 16 adjourn for the day. There's some things that we all need to
04:50:35 17 talk about outside of your presence.

04:50:39 18 So, during the overnight break, please do not discuss
04:50:42 19 this case with anyone, including family members, including one
04:50:44 20 another, and please do not do any independent research
04:50:47 21 regarding any of the issues that you've heard discussed in
04:50:50 22 this case.

04:50:50 23 Thank you very much for your attention today. We
04:50:53 24 will reconvene and start again at 10:00 o'clock tomorrow
04:50:56 25 morning.

1 Mr. Menchel, please proceed.

2 DANIEL FISCHEL, DEFENDANT PACILIO'S WITNESS, PREVIOUSLY SWORN,

3 DIRECT EXAMINATION (RESUMED)

4 BY MR. MENCHEL:

5 Q. You all set?

6 A. Yes, thank you.

7 Q. Dr. Fischel, good morning.

8 A. Good morning.

9 Q. I want to talk to you now about the government's trial
10 episodes involving Mr. Pacilio, okay?

11 A. Yes.

12 Q. Did you determine whether there were other trading
13 sequences involving Mr. Pacilio besides the 50 trial episodes
14 in which large visible orders were placed opposite iceberg
15 orders?

16 A. Yes.

17 Q. And did you prepare a chart summarizing your findings?

18 A. Yes.

19 Q. I'd like to show you, for your eyes only, tab 9 -- I'm
20 sorry, Exhibit 319 --

21 MR. MENCHEL: Defendants' Exhibit 319, your Honor,
22 please.

23 BY MR. MENCHEL:

24 Q. And what is this, Dr. Fischel?

25 A. It is --

1 Q. If you need to use the binder --

2 A. Yes.

3 Q. -- for the sake of both our eyes, that's fine.

4 A. All right.

5 It's an analysis of the total number of episodes
6 involving Mr. Pacilio where there were icebergs placed --
7 excuse me -- visible orders placed opposite icebergs and the
8 visible orders had to meet the large criteria identified by
9 the government.

10 MR. MENCHEL: Okay. I would offer that, your Honor.

11 THE COURT: Any objection?

12 MR. ARMSTRONG: No, your Honor.

13 THE COURT: All right. Defendants' Exhibit 319 is
14 admitted in evidence.

15 (Defendants' Exhibit No. 319 received in evidence.)

16 BY MR. MENCHEL:

17 Q. Now, again, Dr. Fischel, there are a lot of numbers on
18 this, and for those of us that are less numerate, did you
19 prepare a graphical depiction of what's shown in Defendants'
20 Exhibit 319?

21 A. Yes.

22 Q. Okay. I'd like to show you, again, just for your eyes
23 only, Defendants' Exhibit 814, please. And there are four
24 exhibits -- I'm sorry -- four graphical depictions within
25 that.

1 Can you look at those, please.

2 Let me know when you're finished.

3 A. I've done it.

4 Q. Okay. And do those four graphics accurately depict what's
5 shown numerically in Defendants' Exhibit 319?

6 A. Yes.

7 MR. MENCHEL: I would offer, your Honor, Defendants'
8 Exhibit 814.

9 MR. ARMSTRONG: No objection, your Honor. And just
10 to speed it up, we have no objection to any of the exhibits
11 Mr. Menchel mentioned earlier.

12 MR. MENCHEL: Thank you. Appreciate that.

13 THE COURT: All right.

14 814 is admitted in evidence, Defense Exhibit.

15 (Defendants' Exhibit No. 814 received in evidence.)

16 MR. MENCHEL: Please publish it, your Honor.

17 THE COURT: It's published.

18 BY MR. MENCHEL:

19 Q. Okay. So, looking at the first page of Defendants'
20 Exhibit 814, Dr. Fischel, can you explain to the jury what
21 this chart depicts?

22 A. It's a comparison of the total number of episodes where
23 Mr. Pacilio had large visible orders opposite icebergs. And
24 it's a comparison of the total number between August 2008 and
25 October 14 -- October 2014, and a comparison of that number

1 with the number of episodes that are included in the
2 government's sample of 72 total episodes.

3 Q. So, as I understand it, this particular graphic shows that
4 in the government's trial episodes, there are 21 that only
5 involve Mr. Pacilio on both sides; is that right?

6 A. That's correct.

7 Q. But in the overall data for the same time period, there
8 were actually 776 episodes?

9 A. Involving Mr. Pacilio on both sides, that's correct.

10 Q. Does the small sample size that's in the DOJ's -- the
11 government's trial exhibits cause concern for you?

12 A. It does.

13 Q. Why is that?

14 A. Because, again, if you want to analyze trading data, you
15 can't just choose a tiny slice of trading data. If you want
16 to analyze the effect of Mr. Pacilio's placement of large
17 visible orders opposite icebergs, you can't only look at a
18 tiny number of occasions when that occurred, as opposed to the
19 total number of when that occurred.

20 Q. Okay.

21 MR. MENCHEL: If we can move to the next page of this
22 exhibit, which would be page 2.

23 BY MR. MENCHEL:

24 Q. Can you show us, Dr. Fischel, what this graphic depicts --
25 tell us, I mean.

1 A. This is very similar to the first graph, except the
2 difference is this is a combination of Mr. Pacilio and Mr.
3 Bases, where one of them was on the visible order side and the
4 other was on the iceberg side.

5 And what it shows is that there were 608 total
6 episodes where that was the case between October -- August
7 2008 and October 2014, and only five of the 6,008 were
8 included in the government's 72 episodes.

9 Q. And, again, sir, as an economist, does that give you
10 concern, that out of the 608 episodes where Mr. Pacilio and
11 Mr. Bases were on opposite sides of the market, the government
12 has chosen to show the jury five?

13 A. Yes. It raises a serious concern of what statisticians
14 refer to as selection bias.

15 Q. What do you mean by selection bias? What does that term
16 mean?

17 A. Selection bias is where you reach a conclusion based on a
18 biased and unrepresentative sample of whatever the data that
19 you're looking at, and if you looked at the full set of data,
20 you would reach a different conclusion.

21 Q. And is this term, selection bias, is it a known problem in
22 statistical and economic analysis?

23 A. Yes. It's one of the best known errors that can be
24 committed analyzing data, to use an unrepresentative and
25 biased sample of data.

1 Q. Is there a colloquial name that some of us may be more
2 familiar with who are not economists and statisticians to
3 explain selection bias?

4 A. It's frequently referred to as cherry-picking.

5 Q. Cherry-picking?

6 A. Cherry-picking.

7 Q. So -- okay. Thank you.

8 MR. MENCHEL: Can we go to the next slide, please.

9 BY MR. MENCHEL:

10 Q. This is Page 3 of the exhibit. What does this represent,
11 Dr. Fischel?

12 A. This, again, is the same idea, but this is the combination
13 of Mr. Pacilio and Mr. Lakhan.

14 Q. And what does it show?

15 A. It shows that, again, in the same period, from August 2008
16 to October 2014, there were 109 episodes involving Mr. Pacilio
17 and Mr. Lakhan where one of them had a large visible ice -- a
18 large visible order on one side and an iceberg on the opposite
19 side. There are 109 episodes of that, that fit that
20 definition, and only three of the 109 were included in the
21 government's sample.

22 Q. And does this raise the same concern about cherry-picking,
23 or selection bias?

24 A. Yes.

25 Q. Is three a fair and representative sample of 109 times

1 that Mr. Lakhan and Mr. Pacilio were on opposite sides of the
2 market from August 2008 to October 2014?

3 A. No.

4 Q. You understand that one of the things that the government
5 is doing is asking the jury to infer intent, what's inside Mr.
6 Pacilio's mind at the time that he's on another side of the
7 order of one of the other defendants or even with himself; is
8 that right?

9 A. That's my understanding.

10 Q. Okay.

11 And do you have an opinion about whether or not it's
12 appropriate to infer intent from a sample size as small as
13 three?

14 A. No, particularly when a larger sample produces a very
15 different answer.

16 Q. I think you said "no" to my question, but I want to make
17 sure the record is clear.

18 I asked if you have an opinion?

19 A. Oh, excuse me. Yes, I have an opinion.

20 Q. What is that opinion?

21 MR. ARMSTRONG: Objection, your Honor. May we be
22 heard on this?

23 (Proceedings had at sidebar:)

24 THE COURT: Yes.

25 MR. ARMSTRONG: Your Honor, I think this is getting

1 dangerously close to ultimate issue and saying that Mr.
2 Pacilio did or did not have intent to do anything. And that
3 certainly was not disclosed. And that certainly was not how
4 Mr. Fischel was presented to us and the contours of what he
5 would be testifying about.

6 So, we think it's, number one, not disclosed and,
7 number two, improper under 403. It's the jury's job to infer
8 the intent of Mr. Pacilio or not.

9 MR. MENCHEL: Let me just look at how I asked the
10 question, if I may.

11 My question was: Do you have an opinion about
12 whether or not it's appropriate to infer intent from a sample
13 size.

14 I don't see anything wrong with that question. I'm
15 not asking him to opine on anybody's intent.

16 And, frankly, had Dr. Venkataraman testified, he
17 would have absolutely said you can infer intent or that the
18 pattern is consistent with inferring an intent. I'm asking
19 him the opposite question.

20 MR. ARMSTRONG: Your Honor, that's cutting it pretty
21 thin. He's essentially asking the jury that they can't infer
22 any intent from the pattern.

23 THE COURT: I'm going to allow the question as asked.
24 But can you ask it precisely again.

25 MR. MENCHEL: Yes.

1 THE COURT: And I'm going to ask him to give a "Yes"
2 or "No" answer.

3 MR. MENCHEL: Can he explain it after that, or no?
4 I'm just asking him why the number size is not appropriate to
5 allow an economist to infer intent from that small a size.

6 THE COURT: And if you ask him that question, yes, he
7 can explain his answer, as long as he doesn't give an opinion
8 as to what he thinks the intent is or was.

9 (Proceedings had in open court:)

10 BY MR. MENCHEL:

11 Q. Dr. Fischel, I just want you to stay within the confines
12 of the questions I'm about to ask you, okay?

13 A. Okay.

14 Q. All right.

15 Do you have an opinion about whether or not it's
16 appropriate to infer intent from a sample size as small as
17 three? And what I want from that is a "Yes" or "No" answer.
18 Do you have an opinion?

19 A. Yes.

20 Q. Okay.

21 And what is your opinion?

22 A. That it's not appropriate.

23 Q. Why is it not appropriate to try to draw conclusions about
24 one's intent from a sample size of three?

25 A. Because you're not looking at the full data set; and,

1 therefore, you may get the wrong answer.

2 Q. Okay. Thank you.

3 I think there's one final page on this exhibit. And
4 can you -- this is Page 4, for the record, of this exhibit.

5 Can you, Dr. Fischel, tell us what this graphic
6 depicts?

7 A. This is a total of all of the episodes involving Mr.
8 Pacilio, whether Mr. Pacilio was on both sides of the
9 transaction or in some combination with either Mr. Bases or
10 Mr. Lakhan.

11 Q. Let me just stop you there just so -- because it doesn't
12 say that on the chart. I want to be very precise.

13 So, in other words, these are episodes that involve
14 Mr. Pacilio and/or Mr. Lakhan or Mr. Bases?

15 A. Correct.

16 Q. Or himself?

17 A. Correct.

18 Q. Total?

19 A. Correct.

20 Q. All right.

21 And what does the graphic show?

22 A. That there were 1,493 episodes involving Mr. Pacilio where
23 there was a large visible order, meeting the government's
24 definition of what a large order was, and opposite an iceberg.
25 And of those 1,493 episodes, the government included 29 in

1 their 1 -- episodes 1 to 72.

2 Q. And, again, Doctor -- I'm sorry, Professor Fischel, what
3 is the significance of the 1,493 total episodes versus the 29
4 that the government chose?

5 A. Again, it's just a classic example of selection bias, of
6 drawing a conclusion based on an unrepresentative and biased
7 sample of data.

8 Q. Okay.

9 Now, I want to show you --

10 MR. MENCHEL: And I understand there's no objection,
11 your Honor, to Defendants' Exhibit 320.

12 I would move this in evidence, your Honor.

13 THE COURT: Defendants' Exhibit 320 is accepted in
14 evidence.

15 (Defendants' Exhibit No. 320 received in evidence.)

16 BY MR. MENCHEL:

17 Q. What does this chart that you've prepared, Dr. Fischel,
18 show?

19 A. This shows a number of different things: The percentage
20 of times that some icebergs executed, the percentage of times
21 that some visible orders executed, and some other data
22 involving how quickly orders remained open before they were
23 closed.

24 Q. And as before, have you also prepared graphical depictions
25 of what these numbers are in ways that we can see visually?

1 A. Yes.

2 Q. All right.

3 I'd like to show you --

4 MR. MENCHEL: My understanding is there is no
5 objection to this, as well, your Honor.

6 BY MR. MENCHEL:

7 Q. -- Defendants' Exhibit 815.

8 Is this one of the graphs that is shown numerically
9 in Defendants' Exhibit 320?

10 A. Yes.

11 Q. Can you explain to the members of the jury what this
12 shows, please.

13 A. Yes. This is a comparison in the full set of data what
14 percentage of the time some of the visible icebergs that were
15 placed -- visible orders, excuse me, that were placed opposite
16 icebergs executed, as compared with the percentage of times
17 that some percentage of the icebergs orders executed, again,
18 for the full data set versus what the result would be if you
19 just looked at the government data included in episodes 1 to
20 72.

21 Q. So, let me just start first with the government's
22 episodes.

23 So, in the government's trial episodes, the 1 to 72,
24 how often does the iceberg get an execution?

25 A. A hundred percent.

1 Q. Okay.

2 And in the government's trial episodes, how often
3 does Mr. Pacilio get an execution on what they call the spoof
4 side, the visible side?

5 A. 4.8 percent.

6 Q. Okay.

7 And when you go to the overall data involving Mr.
8 Pacilio when he's placing visible orders against iceberg
9 orders, how often in the overall data does Mr. Pacilio get
10 executions on the iceberg side?

11 A. 41 percent.

12 Q. To be precise, 41.4?

13 A. Excuse me, 41.4 percent.

14 Q. Okay.

15 And in the visible side, the side that the government
16 is claiming you would never want to get an execution on, how
17 often does that happen?

18 A. 21 percent.

19 Q. Okay.

20 And what can you conclude when you compare the
21 government's trial episodes to all the episodes in which Mr.
22 Pacilio, during the period of time, 2008 to October 2014, was
23 placing large visible orders opposite iceberg orders?

24 A. You conclude, again, that if you look at a biased and
25 non-representative sample of data, you get the wrong answer, a

1 very different answer, than if you look at the complete set of
2 data.

3 MR. MENCHEL: Can we go to the next chart, please.

4 This would be Page 2 of Exhibit 815.

5 BY MR. MENCHEL:

6 Q. Can you again describe for us, Dr. Fischel, what this
7 shows?

8 A. This is, again, the same type of analysis, but as opposed
9 to Mr. Pacilio being both on the visible order side and the
10 iceberg side, this is a combination of Mr. Pacilio and Mr.
11 Bases where one was on one side and the other was on the other
12 side.

13 Q. And using just the government's episodes, when Mr. Pacilio
14 and Mr. Bases were on one side of the market and the other was
15 on the other side, how often did the iceberg side get
16 executions?

17 A. A hundred percent.

18 Q. And when Mr. Bases and Mr. Pacilio were on opposite sides
19 of the market at the same time, how often did the large --
20 what they call -- spoof order get executions?

21 A. Zero percent.

22 Q. When you look at all of the times that Mr. Pacilio and Mr.
23 Bases were on opposite sides of the market from August 2008 to
24 October 2014, how many times did they get executions on what
25 were considered to be the spoof side?

1 A. 36.7 percent.

2 Q. And how often did they actually get executions on what
3 they -- what the government is calling the real order, the
4 iceberg order?

5 A. 9.5 percent.

6 Q. Dr. Fischel, what can you conclude from this graph?

7 A. The same answer. When you look at a biased and
8 non-representative sample of data, you get the wrong answer;
9 and you get a very different answer if you look at the full
10 set of data.

11 Q. And if one were trying to infer intent, okay, would this
12 graph be an example of why that would be problematic?

13 A. Yes. It would be problematic not to look at the entire
14 set of data.

15 MR. MENCHEL: Can we go to the next slide, please,
16 which -- I believe it's Page 3 of this exhibit.

17 BY MR. MENCHEL:

18 Q. What does this show, please?

19 A. This is the same analysis, but now the combination is Mr.
20 Pacilio and Mr. Lakhan.

21 Q. Okay.

22 And you understand there's been testimony in this
23 case by Mr. Lakhan that Mr. Pacilio and Mr. Lakhan were
24 working in a coordinated fashion, as well?

25 A. That's my understanding.

1 Q. Okay.

2 So, in the government's episodes, when they have Mr.
3 Lakhan and Mr. Pacilio opposite each other in the market, how
4 often does what the government calls the real or the iceberg
5 side get executions?

6 A. 100 percent.

7 Q. And in that same -- in those same examples, how often does
8 what the government called the fake or spoof side get
9 executions?

10 A. Zero percent.

11 Q. Okay.

12 Now, when you look at all of the data where Mr.
13 Pacilio and Mr. Lakhan were opposite each other from August
14 2008 to October 2014, how often do they get an execution on
15 what the government's calling the fake side?

16 A. 56 percent.

17 Q. And how often are they getting executions on what the
18 government is saying is the side they really want to get
19 executions on?

20 A. 18.3 percent.

21 Q. Again, what can you conclude when you look at all of the
22 data instead of just the ones that were specifically selected
23 by the government?

24 A. Same answer. If you look at a biased and
25 non-representative sample of data, you get the wrong answer;

1 and you get a much more accurate answer if you look at all the
2 data.

3 Q. Okay.

4 Now, you also created additional graphs using that
5 same numerical chart that we saw before --

6 THE COURT: Hold on.

7 Go ahead.

8 MR. MENCHEL: Okay.

9 I wasn't sure if I was too loud or something.

10 BY MR. MENCHEL:

11 Q. I'd like to show you now, Professor, Defendants' Exhibit
12 816.

13 MR. MENCHEL: And my understanding, your Honor, is
14 there's no objection. So I would move to admit that.

15 THE COURT: Defendants' Exhibit 816 is admitted in
16 evidence.

17 (Defendants' Exhibit No. 816 received in evidence.)

18 BY MR. MENCHEL:

19 Q. Okay.

20 So, Professor, can you again show us what it is
21 that's being depicted in Defense Exhibit 816?

22 A. This is a comparison of how quickly orders closed within
23 five seconds -- orders were canceled within five seconds,
24 again, comparing the government's episodes 1 to 72 with all of
25 Mr. Pacilio's episodes where he was on both sides of the

1 episode, the -- placing the visible -- the large visible order
2 and the iceberg.

3 Q. You know, Professor, I apologize. I want to go back. I
4 left out some questions I wanted to ask you with the prior
5 exhibits.

6 MR. MENCHEL: Can we pull up the third page of 815 --
7 my apologies -- just as an example.

8 BY MR. MENCHEL:

9 Q. Do these findings -- are they consistent with your prior
10 testimony about how market participants can respond to a large
11 visible order?

12 A. Yes.

13 Q. In what way?

14 A. Well, if you look at, for example, the 56 percent, looking
15 at the full data set of visible orders, that means there were
16 some executions in 56 percent of the time when there was a
17 large visible order opposite an iceberg. And based on the
18 government's claim, there should be no executions opposite a
19 large visible -- excuse me, when you place a large visible
20 order because if you remember, steps 1 through 4 where we
21 began, all of the visible orders were canceled. There were no
22 executions. And what -- and you can see that that's
23 consistent, zero percent in the DOJ trial episodes. But when
24 you look at all of the data, you get a very different answer.

25 And, again, that's because, as I explained yesterday,

1 there are different types of reactions to the placement of
2 visible orders, including people who now see an opportunity to
3 transact on the opposite side of the visible order and execute
4 against those orders.

5 So, the 56 percent represents all the different
6 categories of traders, and the zero percent represents the one
7 sliver of data that the government chose to represent.

8 Q. So, looking at the actual data, is it fair to say this
9 pattern will always work like clockwork, meaning you place an
10 iceberg opposite a large visible order and, like clockwork,
11 it's always -- the market's always going to move in the
12 direction of the large visible order?

13 A. No, that's not fair.

14 Q. Because why?

15 A. Because that's not what happens. That happens some of the
16 time. That's what the government trial episodes show. I
17 mean, it's real data for the 72 episodes. But it doesn't
18 happen all the time. And the phrase, "working like
19 clockwork," suggests or means that it happens all the time.
20 But, again, based on economic literature and based on the
21 data, it doesn't happen all the time.

22 Q. All right. Thank you.

23 MR. MENCHEL: And, by the way, your Honor, I don't
24 know if I formally moved to admit 815.

25 THE COURT: You did not.

1 MR. MENCHEL: So I'm doing it now, please.

2 THE COURT: 815 is admitted in evidence.

3 (Defendants' Exhibit No. 815 received in evidence.)

4 MR. MENCHEL: Now let's go to 816, which I think I
5 have formally moved to admit.

6 THE COURT: You have.

7 BY MR. MENCHEL:

8 Q. And, I apologize, can you just summarize this again,
9 please?

10 A. Yes. This is, again, the same data set now with Mr.
11 Pacilio on both sides placing a large visible order and
12 opposite the iceberg. And it's analyzing, when the visible
13 orders were closed within five seconds, how often that
14 occurred.

15 Q. And in the government's trial episodes involving Mr.
16 Pacilio, how often did the large visible order, when it was
17 opposite an iceberg order, close within five seconds or less?

18 A. 100 percent of the time.

19 Q. And when you looked at all of the episodes -- which were
20 776; is that right?

21 A. That's right.

22 Q. How often did Mr. Pacilio's large visible order cancel
23 within five seconds or less?

24 A. 36.7 percent.

25 Q. So, if we were to invert that, approximately how often did

1 Mr. Pacilio place a large visible order versus an iceberg
2 where he didn't -- he canceled it after five seconds or
3 longer?

4 A. If my math is right, 63.3 percent of the time.

5 Q. So, two-thirds of the time, approximately, he actually
6 kept the large visible order open for more than five seconds?

7 A. That's right.

8 Q. All right.

9 And is five seconds based on your study of the
10 market --

11 A. No, it --

12 Q. Well, hold on. Let me finish the question.

13 A. Again, it's based on the government criteria.

14 Q. I didn't finish the question.

15 One second, please.

16 A. Excuse me.

17 Q. Does it also show in this chart how often the icebergs got
18 executions?

19 A. I'm --

20 Q. I'm sorry. One second, please.

21 (Brief pause.)

22 BY MR. MENCHEL:

23 Q. I'm sorry. What I meant to ask you was: Does this chart
24 also show the large visible order where there were icebergs
25 being executed and how often that order stayed open?

1 A. Yes. That's right. I wanted to make sure I understood
2 your question.

3 Q. Yes. My question was poorly framed. I apologize.

4 MR. MENCHEL: Next slide, please.

5 BY MR. MENCHEL:

6 Q. What does this demonstrate, Professor Fischel?

7 A. Again, it's the same analysis, but this time with the
8 combination of Mr. Pacilio and Mr. Bases.

9 Q. Okay.

10 And if we look at the graphical depiction on the
11 right, what does the hundred percent represent?

12 A. It represents, in situations where there are iceberg
13 executions in the government sample, all visible orders
14 opposite icebergs were canceled within five seconds a hundred
15 percent of the time.

16 Q. Okay.

17 And when you looked at all of the episodes in which
18 Mr. Pacilio and Mr. Bases were on opposite sides of the market
19 where there was a large visible order and there were iceberg
20 executions, how often did the large visible order stay open --
21 I'm sorry -- close within five seconds or less?

22 A. 4.9 percent of the time.

23 Q. So, conversely, how often did an order -- a large visible
24 order opposite an iceberg where the iceberg got executions did
25 the large visible order stay open for longer than five

1 seconds?

2 A. 95.1 percent of the time.

3 Q. And in these markets, by the way, based on your
4 understanding of the speed, how much time is five seconds?

5 A. It's a very long period.

6 Q. Why is that?

7 A. Because trades either get executed or canceled very
8 quickly, prices move very quickly, time is monitored in
9 milliseconds. It's a speed that is really hard to appreciate.
10 But with manual traders and algorithmic traders all operating
11 at the same time, the speed of both cancellations and
12 executions typically happens very quickly.

13 Q. Thank you.

14 MR. MENCHEL: Next page, please.

15 BY MR. MENCHEL:

16 Q. What does this depict?

17 A. This is the same analysis, but now the combination is Mr.
18 Pacilio and Mr. Lakhan.

19 Q. And, so, this -- in the government's episodes, how often
20 is it that either Mr. Pacilio or Mr. Lakhan places a large
21 visible order, the iceberg gets executions, and the order
22 closes -- the visible order closes within five seconds or
23 less?

24 A. A hundred percent of the time.

25 Q. Okay.

1 And when you look at all the episodes involving Mr.
2 Pacilio and Mr. Lakhan, which were 109 episodes, how often was
3 it that the large visible order, after the iceberg got
4 executions, was canceled within five seconds or less?

5 A. 10.1 percent of the time.

6 Q. And, therefore, conversely, how often was the large
7 visible order -- what the government is calling fake -- how
8 often did it stay open for longer than five seconds or more?

9 A. 89.9 percent of the time.

10 Q. Okay.

11 I want to show you now Defense Exhibit 321, please.

12 MR. MENCHEL: I would move this into evidence, your
13 Honor.

14 THE COURT: Defense Exhibit 321 is accepted in
15 evidence.

16 (Defendants' Exhibit No. 321 received in evidence.)

17 BY MR. MENCHEL:

18 Q. Dr. Fischel, what does this chart represent, please?

19 I'm sorry, I keep calling you "doctor." It's
20 Professor Fischel?

21 A. Yeah, it is -- I'm not a doctor, I'm a professor, so --

22 Q. Yeah.

23 What does this show, please?

24 A. This is, again, a similar but a different type of
25 comparison. It's a comparison of the number of contracts

1 executed on the visible order side and the iceberg order side
2 in episodes where Mr. Pacilio was both on the visible order --
3 the large visible order side and also on the iceberg side.

4 MR. MENCHEL: And, you know what -- apologize again.
5 But before we get there, can we go back to 816 and just
6 quickly scroll through, Abbie.

7 BY MR. MENCHEL:

8 Q. Do these exhibits, in your opinion, Dr. Fischel, also show
9 the cherry-picking or selection?

10 A. Professor. Professor, please.

11 Q. I could blame the Court because he started with it, but it
12 would really be unfair because I'm doing the same thing, too.

13 Professor, do these exhibits also show, inherent in
14 the government's selection, that it's biased and
15 cherry-picked?

16 A. In my opinion, yes.

17 Q. And why is that again?

18 A. Because if you look at the government's biased and
19 non-representative sample, you get a very different answer,
20 and the wrong answer, as compared with the answer that you get
21 looking at the full sample.

22 Q. Okay.

23 MR. MENCHEL: Now going back to 321, please.

24 BY MR. MENCHEL:

25 Q. Did you also prepare graphical depictions of what's shown

1 in Defense Exhibit 321?

2 A. Yes.

3 Q. All right.

4 I'd like to show you Defense Exhibit 817.

5 MR. MENCHEL: I would move to admit that, your Honor.

6 THE COURT: Defense Exhibit 817 is admitted in

7 evidence.

8 (Defendants' Exhibit No. 817 received in evidence.)

9 BY MR. MENCHEL:

10 Q. Now, I want to move slowly on this one, Professor, okay?

11 What does the first page of Defendants' Exhibit 817
12 show, please?

13 A. Again, these are episodes where Mr. Pacilio is both on the
14 visible order side, the large visible order side, and on the
15 iceberg side. And it's a comparison of the number of
16 contracts traded -- the number of executions, in other
17 words -- contracts traded on the visible side and the iceberg
18 side in the government's sample of 1 to 72, as compared with
19 the full sample that I have analyzed.

20 Q. Okay.

21 Now, I think you were here for some of the testimony
22 by one of the case agents in this case that showed charts
23 showing fill ratios.

24 Do you recall that?

25 A. Yes.

1 Q. Okay.

2 And what does this show in comparison to showing
3 ratios? What does 817 show?

4 A. This shows actual number of fills, actual number of
5 contracts executed rather than a percentage.

6 Q. Okay.

7 And when we look at the actual number of fills, as
8 you called it, or contracts that have been executed, in the
9 government's episode on the iceberg side, how often are there
10 executions on the iceberg side?

11 A. 307 times.

12 Q. And how often in the government's episodes are there any
13 executions on what they call the fake or spoof side?

14 A. One time.

15 Q. Okay.

16 Now, when you looked at all of the data for Mr.
17 Pacilio from the years August 2008 to October 2014, in
18 actuality, sir, how many executions does Mr. Pacilio get on
19 what the government is calling the fake side, the side he
20 never wants to get filled on?

21 A. 4,117.

22 Q. And on the iceberg side, how often does he get actual
23 fills?

24 A. 4,592 times.

25 Q. I'm not so great at math either, but am I right that

1 approximately -- the visible side -- what the government's
2 calling the fake side -- is approximately 90 percent of the
3 iceberg side?

4 A. That looks about right.

5 Q. And in the government's episodes, it's about 3 percent --
6 .3 percent? I'm sorry.

7 A. Yeah, it's less than 3 percent.

8 Q. It's .3 percent?

9 A. Right. That's right.

10 Q. Do you think the government's episodes, therefore, are
11 fairly representative of what's going on in the broader
12 trading data when it comes to Mr. Pacilio when he places
13 visible contracts opposite icebergs?

14 A. No, I don't.

15 Q. Does this suffer from any type of a bias that's known in
16 the literature and in the academic study of statistical and
17 economic analysis?

18 A. Yes. This would be a classic -- really an extreme form --
19 of selection bias.

20 MR. MENCHEL: Let's go to the next chart, please.

21 BY MR. MENCHEL:

22 Q. What does this depict, Professor Fischel?

23 A. This is the same analysis, but when -- this time it's when
24 Mr. Pacilio was on one side and Mr. Bases is on the other
25 side.

1 Q. Okay.

2 And in the government's episodes 1 through 17, how
3 often do either Mr. Bases or Mr. Pacilio get an execution on
4 the iceberg side?

5 A. 18 times.

6 Q. And in the government's selected episodes, how often does
7 either Mr. Pacilio or Mr. Bases get an execution on what they
8 call the spoof or fake side?

9 A. Zero times.

10 Q. Now, when you go to the broader data, sir, and you look at
11 all the times that Mr. Bases and Mr. Pacilio were opposite one
12 another from August 2008 to October 2014, how often are the
13 visible orders actually getting executions?

14 A. 14,888 times.

15 Q. And how often are the icebergs executing?

16 A. 5,759 times.

17 MR. MENCHEL: Next slide, please.

18 BY MR. MENCHEL:

19 Q. What does this depict, sir?

20 A. Again, the same analysis -- same comparison, but this time
21 where Mr. Pacilio is on one side and Mr. Lakhan is on the
22 other side.

23 Q. And in the government's episodes, what happens when Mr.
24 Pacilio is on one side and Mr. Lakhan is on the other side
25 when it comes to the iceberg side?

1 A. There are 35 executions.

2 Q. And when it comes to the side that the government is
3 calling a spoof or fake order, how often are executions
4 occurring?

5 A. Zero.

6 Q. When you look at all the data from August 2008 to October
7 2014 in which Mr. Pacilio and Mr. Lakhan were opposite each
8 other, one with an iceberg and one with a visible order, how
9 often does either one of them get an execution on what the
10 government has referred to as the fake or spoof side?

11 A. 3,919 times.

12 Q. And how often does either Mr. Lakhan or Mr. Pacilio get an
13 execution on what the government says is the only side they
14 really want executions on?

15 A. 1,759 times.

16 Q. What does this chart tell you about the selection that the
17 government used in its 72 episodes that was presented to the
18 jury in this case?

19 A. Again, it's a biased and non-representative sample of the
20 relevant data.

21 MR. MENCHEL: Next slide, please.

22 BY MR. MENCHEL:

23 Q. What does this depict?

24 A. Again, this is the total involving all of the different
25 combinations involving Mr. Pacilio, where he was on both

1 sides, on the large visible order side and on the iceberg
2 side, or where he was in some combination with either Mr.
3 Bases or Mr. Lakhan; adding all those together.

4 Q. And can you walk us through what it shows, please?

5 A. Well, if you look at the government data in Exhibit --
6 their episodes 1 to 72, there were 360 executions on the
7 iceberg side and one on the large visible order side. But if
8 you look at all the data, there were 22,924 executions on the
9 large visible order side and 12,110 executions on the iceberg
10 side.

11 Q. Okay.

12 So, all told, looking at all of these charts, are
13 they relevant to your opinion concerning whether the trial
14 episodes that the government selected are representative of
15 the trading sequences involving Mr. Pacilio in which large
16 visible orders were placed opposite iceberg orders?

17 A. I do not believe they were representative.

18 Q. And, again, why is that?

19 A. Because if you compare the results in all the different
20 analyses that I've described, looking at just the data from
21 the government's episodes 1 to 72, and you compare that with
22 the entire set of data, you get a very different answer.

23 Q. Now, you previously testified, I think, about your
24 analysis of Mr. Pacilio's aggressive orders; am I right?

25 A. Correct.

1 Q. And to remind the jury again, an aggressive order is an
2 order that actually crosses the spread to get instant
3 executions?

4 A. Correct.

5 Q. Were some of the large visible orders that Mr. Pacilio
6 placed opposite an iceberg order?

7 A. Yes.

8 Q. And did the -- I'm sorry, did the government's trial
9 episodes include any visible iceberg episodes in which Mr.
10 Pacilio placed an aggressive visible order?

11 A. No.

12 Q. Is that relevant to your opinion and testimony in this
13 case?

14 A. Yes.

15 Q. How so?

16 A. Because when you place an aggressive visible order, you
17 want to get an execution. You know you're going to get an
18 execution. And to the extent that the four-step alleged
19 fraudulent scheme of the government has, for all practical
20 purposes, no executions on the large visible side, to leave
21 out a set of transactions where you know you're going to get
22 executions when you place the order, again, to me, is a form
23 of selection bias.

24 Q. Now, there was a nice woman named Dr. Garibotti who
25 testified from AGI in this case. You're familiar with AGI?

1 A. I am.

2 Q. Analysis Group?

3 A. Yes.

4 Q. And she testified that in the DOJ trial episodes, the
5 government's episodes, she was asked about what something
6 tended to happen. And she said that the iceberg orders tend
7 to be executed, and the visible orders tend not to be
8 executed.

9 You're aware of that testimony?

10 A. I am.

11 Q. Okay.

12 In your opinion, does Dr. Garibotti's observation,
13 that fact alone, support the government's position that Mr.
14 Pacilio did not intend his visible orders to be executed and
15 placed them because he expected that his large iceberg orders
16 would get executions instead?

17 A. Does not.

18 Q. Why not?

19 A. Because it's a mischaracterization of the data.

20 Q. When you look at all the data?

21 A. When you look at all the data.

22 Q. When you look at just the government's data, it's
23 accurate, right?

24 A. Well, again, that's the selection bias. But, yes, if you
25 looked at the wrong set of data, you would get that answer.

1 Q. In your opinion, do the data for all the visible orders
2 opposite iceberg orders support the government's claim
3 regarding the alleged fraudulent scheme in this case?

4 A. In my opinion, all the data, if you look at it, does not
5 support the four-step alleged fraudulent scheme in this case.

6 Q. And why is that?

7 A. Because in the four-step fraudulent scheme, the icebergs
8 always ind- -- always execute; the large visible orders never
9 execute. And when you look at all the data, that clearly is
10 wrong. That's not a fair description of the result that you
11 get if you look at all the relevant data.

12 Q. So, in your opinion, is it appropriate to reach a
13 conclusion about what Mr. Pacilio intended when he placed
14 visible orders opposite iceberg orders from a
15 non-representative sample of trading episodes?

16 A. My opinion, it's not appropriate.

17 Q. Why not?

18 A. It's really just the same answer. If you're trying to
19 draw a conclusion from a biased and non-representative sample
20 of data, you're going to draw the wrong conclusion relative to
21 the conclusion that you would reach if you looked at the full
22 set of data.

23 Q. Okay.

24 Now, I'd like to ask you some questions about the
25 government's exhibits concerning trial episodes 1 to 50.

1 MR. MENCHEL: And if we can pull up, please,
2 Government Exhibit 1.

3 And this is an example. If we can go to Page No. 8,
4 please.

5 BY MR. MENCHEL:

6 Q. Do you understand that all of the trading episodes that
7 were included in Government Exhibit 1 in which Mr. Pacilio
8 placed visible orders fit the pattern of the government's
9 four-step fraudulent scheme?

10 A. Yes, that's my understanding.

11 Q. Does that change your opinion about what you can infer
12 from the data?

13 A. No.

14 Q. Why not?

15 A. Really for the same reason, that all of these type of
16 graphs are all based on a biased and non-representative sample
17 of data; and if you calculated or constructed the exact same
18 graphs on a full set of data, again, you would reach a
19 different conclusion.

20 Q. Now, in this example, Mr. Pacilio placed a large visible
21 contract to sell 225 contracts.

22 Do you see that?

23 A. Yes.

24 Q. And then he canceled it, or he kept it open for only .733
25 seconds?

1 A. Correct.

2 Q. Okay.

3 And he didn't get any executions?

4 A. Correct.

5 Q. Can you explain, from an economic standpoint, what would
6 be a reason why a trader would place a large visible order and
7 then cancel it relatively quickly?

8 MR. ARMSTRONG: Objection, your Honor. Could we be
9 heard on this, please.

10 (Proceedings had at sidebar:)

11 MR. ARMSTRONG: Your Honor, I believe this goes
12 beyond the scope of what Mr. Fischel was disclosed to be
13 testifying about. There was nothing in the disclosure about
14 Mr. Fischel opining about specific episodes. It was more just
15 general trends in the trading data and what the general trends
16 show or do not show.

17 MR. MENCHEL: I could draw a hypothetical one. I'm
18 not really sure it changes anything. The point is to show
19 that there are economic reasons why a trader would quickly
20 place and cancel an order in these markets.

21 MR. ARMSTRONG: Your Honor, it goes to the same
22 deficiency, that Mr. Fischel was not disclosed to be talking
23 about what hypothetical reasons traders do or do not cancel
24 trades. He was disclosed to be talking about the patterns and
25 what he can see or not see in the patterns, not the reasons

1 for why traders do certain things.

2 THE COURT: All right.

3 I need to find the disclosure. So, we'll do it at a
4 break.

5 (Proceedings had in open court:)

6 THE COURT: Ladies and gentlemen, at this time, we
7 will take our morning break, and so we'll break for
8 approximately ten minutes. Thank you.

9 (Jury out.)

10 THE COURT: Professor Fischel, you may step down.

11 THE WITNESS: Thank you, your Honor.

12 MR. MENCHEL: I'll need a moment, as well, your
13 Honor, if that's okay.

14 THE COURT: That's fine.

15 Why don't we just take a quick break, and then we'll
16 come back and talk about this.

17 (Brief recess.)

18 THE COURT: Mr. Menchel?

19 MR. MENCHEL: First of all, I would point out that I
20 do think --

21 THE COURT: Hold on for one second.

22 MR. ARMSTRONG: Your Honor, I just want to make one
23 clarification. I'm not jumping in front of Mr. Menchel.

24 We do plan to talk about, on cross-examination with
25 Professor Fischel, specific episodes. So, you know, just to

1 be fully transparent to the Court, we don't want to be, you
2 know, having it both ways, because we are going to get into
3 specific episodes with him on cross. So, just to let the
4 Court know about that.

5 THE COURT: Okay.

6 But we're talking about the question of why traders
7 can -- reasons that traders might cancel orders quickly,
8 right?

9 MR. MENCHEL: Yeah.

10 THE COURT: That was the question.

11 And, so, does the government still maintain its
12 objection to that question?

13 MR. ARMSTRONG: I think so, your Honor.

14 THE COURT: Go ahead, Mr. Menchel.

15 MR. MENCHEL: Well, I think, two things.

16 One, I think it is fairly covered by the disclosure
17 on -- of May 11th, 2021, on Page 3, first middle -- first full
18 paragraph, middle of the page: "Professor Fischel is expected
19 to testify that because traders respond quickly to changes in
20 market conditions, modern electronic markets are routinely
21 characterized by high order cancellation rates."

22 So, he's going to talk about the changes in market
23 conditions and why traders would opt to trade.

24 Also, there's been a lot of testimony elicited in the
25 government's case from virtually every witness -- from agents,

1 from other traders -- about going into these moments and
2 saying, what happened from here to here? Was there anything
3 new -- okay -- to suggest to this jury that there would have
4 been no reason to place an order and quickly cancel it.

5 So, even if it had not been disclosed, and I would
6 respectfully submit this is sufficient, it's fair response to
7 what the government has injected into this case. And like any
8 other witness we could call, I think he'd be entitled to say
9 that.

10 THE COURT: All right.

11 So, I think it's fairly disclosed, to the extent that
12 Professor Fischel is going to talk about the fact that market
13 conditions might cause a trader to withdraw trades or cancel
14 trades. I was worried that you were going to have him testify
15 as to various trading strategies.

16 MR. MENCHEL: No. Well, let me be clear about that.
17 He's going to say two things. Not a specific strategy, no.
18 He's going to say, one, changes in market conditions can cause
19 a trader to change; and, two, elaborate on the point we talked
20 about yesterday, this free-option notion of not -- not being
21 the insurance for the other trader is one of the reasons why
22 you want to get out.

23 THE COURT: Any objection to those two points?

24 MR. ARMSTRONG: Your Honor, I think that
25 generalizations and blanket statements about reasons why

1 someone could potentially do something are fine, and we would
2 have no objection to that, as long as it is untethered to what
3 Mr. Pacilio was doing when he was canceling his trades.

4 That's the distinction.

5 MR. MENCHEL: That's fine. I'm really just using
6 this as a demonstrative. I'm not getting into a specific
7 moment to say this is what must have been in his mind. It's
8 just an example of why any trader, Mr. Pacilio or anybody,
9 would actually do what's being shown in that graph. That's
10 all.

11 THE COURT: All right.

12 Well, why don't you just ask him the questions
13 untethered from the charts.

14 MR. MENCHEL: You're saying I can't use the chart?

15 THE COURT: Right. You can draw your own chart if
16 you want. But given the fact that the government -- I think
17 that to use this demonstrative and to have Professor Fischel,
18 who is qualified as an expert, answer questions about the
19 chart along the lines of what you've done, which is a general
20 question, I think the jury might misinterpret that to mean
21 that it applies specifically to Mr. Pacilio.

22 MR. MENCHEL: Okay.

23 THE COURT: Okay?

24 MR. ARMSTRONG: Your Honor, could we just be heard on
25 one small issue very quickly.

1 I think your Honor was clear and the parties were
2 clear that there would be no contact with the witness by the
3 attorneys last night. I think that there was testimony that,
4 in fact, there was contact and there was discussion.

5 So, we would respectfully request an opportunity to
6 question Mr. Fischel about those conversations outside the
7 presence of the jury.

8 THE COURT: I think the only one conversation with
9 what Mr. Menchel said he was going to tell him, which is to
10 move things along.

11 MR. MENCHEL: I told him I thought the Judge was
12 getting aggravated with the pace, and we should tighten up the
13 questions --

14 THE COURT: And --

15 MR. MENCHEL: -- and answers.

16 THE COURT: -- I think we all knew that. And there
17 was no objection at the time. And I'm grateful that
18 Mr. Menchel did that. So, that request is denied.

19 All right. Let's bring the jury in.

20 (Brief pause.)

21 MR. MENCHEL: We need to get Professor Fischel.

22 THE COURT: Yes, that would be helpful, too.

23 MR. MCGILL: I will get him.

24 MR. MENCHEL: Sorry. I didn't realize he wasn't
25 here.

1 (Jury in.)

2 THE COURT: So, ladies and gentlemen of the jury, we
3 will go until about 11:40, at which point you'll be escorted
4 down for your Friday COVID test.

5 Please proceed.

6 BY MR. MENCHEL:

7 Q. Professor, before the break, we were talking about the
8 episodes -- the 72 episodes that the government chose in this
9 case.

10 Have you had a chance to look at those?

11 A. Yes.

12 Q. And in general, do those episodes show quick cancellations
13 occurring on the large visible side; Mr. Pacilio's placing an
14 order and then quickly canceling it?

15 A. Yes.

16 Q. I want to draw out a diagram of just what would be an
17 example.

18 MR. MENCHEL: If I could have the Elmo, please, your
19 Honor, or the document.

20 What do you guys call it in here, document --

21 THE COURT: Document camera.

22 MR. MENCHEL: Okay. I've heard it called Elmo. I've
23 heard it called different things. The document camera.

24 BY MR. MENCHEL:

25 Q. I want you to just assume any trader placing a large

1 visible order on the sell side, say, for a hundred contracts.

2 K means contracts. You understand that?

3 A. Yes.

4 Q. Okay.

5 And they're right here at the best offer, okay? I
6 want you to assume that --

7 A. Okay.

8 Q. -- all right?

9 And the trader then decides within less than a second
10 to cancel that order without any executions.

11 Do you see that?

12 A. Yes, I see that.

13 Q. All right.

14 What would be economic reasons, based on your
15 understanding of the market, of why a trader would place a
16 large visible order and then quickly cancel it within less
17 than a second?

18 A. Well, one reason might be that there were intervening
19 events in that second that caused the trader to decide that --
20 no longer wanted to keep the offer open.

21 Q. Okay.

22 And I think you also talked yesterday about, and I
23 might have used the term, "free option." Do you recall that
24 testimony?

25 A. Yes, I do.

1 Q. Okay.

2 And I'm not -- I think I said the jury might have
3 heard that term, and I might have been wrong about that. So,
4 I want to talk about that a little bit more.

5 Can you explain again to the members of the jury what
6 would be another reason why a trader, after placing a large
7 visible order, would want to get out of that quickly?

8 A. Well, again, this is a market in which prices move very
9 quickly. And placing an order and canceling it quickly, first
10 of all, does not mean that there won't be executions because
11 executions can happen instantaneously. But whether or not
12 instant -- whether or not executions can occur, the trader
13 might not want to leave an offer outstanding because the
14 trader might want to protect himself or herself against the
15 possibility of prices moving in the wrong direction.

16 And the way to protect yourself is to limit the time
17 that the offer is open because if you limit the time that the
18 offer is open, you're not providing what was referred to
19 yesterday as a free option to other traders to execute against
20 you if it's in their interest to do so when it's not in your
21 interest to continue to be willing to trade.

22 Q. All right.

23 So I want to draw something and maybe try to explain
24 this a little bit easier.

25 So, let's assume that the bid, the best bid at this

1 point, is \$9, okay?

2 A. Okay.

3 Q. The best sell is \$10. So, there's a spread of \$1 between
4 the best bid and the best sell or best ask, right?

5 A. Okay.

6 Q. Or best offer?

7 A. Okay.

8 Q. And a trader places an offer to buy of 9.20. This now
9 becomes the best bid.

10 Do you see that?

11 A. Yes.

12 Q. And let's assume that another trader who is able to act
13 really fast jumps ahead at 9.30, and there were willing
14 sellers in the market. Which price is more attractive to the
15 seller, the \$9.20 or the \$9.30?

16 A. \$9.30 obviously.

17 Q. Okay.

18 So, this -- this becomes the executed order
19 (indicating).

20 You testified yesterday about one of the articles
21 that you reviewed and the concept of front-running. Do you
22 recall that?

23 A. Yes.

24 Q. Would this be an example of being front-run, one trader by
25 another?

1 A. Yes, that is what front-running is in this context.

2 Q. All right. Now, if the prices continue to rise, let's say
3 it goes up to 9.75, whatever it is, as the price goes up, the
4 trader that purchased this at \$9.30, if they want to sell it,
5 they're going to make some good money, right?

6 A. That's right.

7 Q. Right.

8 Now, if this order is still out on the market while
9 the prices continue to go up (indicating) but then the trader
10 who bought it at 9.30 suspects a trend of the market price
11 going down, what does the \$9.20 order that's just left sitting
12 there do for the trader who bought it at \$9.30?

13 A. It provides a free option, sort of an insurance policy to
14 limit their loss to a very small amount in ways that would not
15 be possible if the order that was placed at 9.20 was canceled.

16 Q. Okay.

17 And the longer that order is just sitting there, the
18 more the possibility exists for that order; is that correct?

19 A. The bigger the risk, correct.

20 Q. Okay.

21 Now, are you familiar, based on your experience in
22 studying markets, a concept called fill-and-kill orders?

23 A. Yes.

24 Q. What is that?

25 A. A fill-and-kill order is an order that is placed that will

1 be canceled immediately after there is a partial execution or
2 not.

3 Q. So, in going to yet one more example, let's assume that
4 there are ten contracts on the sell side for \$10, okay?

5 A. Yes.

6 Q. And a trader decides to place a fill-or-kill order for 20
7 contracts -- so, it's a fill and kill -- I said "or" but I
8 meant "and" -- for 20 contracts at this time for this price of
9 \$10. There's only ten contracts available, but the trader
10 wants 20 contracts. They placed it as a fill and kill. What
11 will happen?

12 A. Ten contracts would be filled, and the remaining ten will
13 be canceled.

14 Q. How quickly?

15 A. Instantly.

16 Q. And what would be a reason, an economic reason, why a
17 trader would place a fill-and-kill order where they only got
18 ten, but they were asking for 20?

19 A. The same reason they don't want to be stuck in the market
20 with an open order where they don't know which way prices are
21 going to move and other traders have the ability to take
22 advantage of them.

23 Q. And what's the speed of a fill and kill?

24 A. Could be, you know, some fraction of a second.

25 Q. It's instantaneous?

1 A. Right.

2 Q. What's there is there, and the rest is gone?

3 A. Right.

4 Q. Okay.

5 Are these types of orders commonly placed in these
6 markets?

7 A. Yes. It's sort of a routine option that traders have.

8 Q. Okay.

9 MR. MENCHEL: One second, please, your Honor.

10 (Brief pause.)

11 BY MR. MENCHEL:

12 Q. I want to show you Defendants' Exhibit 192.

13 MR. MENCHEL: My understanding is there was no
14 objection, your Honor, to this.

15 If we could switch over.

16 THE COURT: Defendants' Exhibit 192 is admitted in
17 evidence.

18 (Defendants' Exhibit No. 192 received in evidence.)

19 MR. MENCHEL: Can you publish that, please, your
20 Honor.

21 BY MR. MENCHEL:

22 Q. What is this exhibit, Professor Fischel?

23 A. This is an exhibit which documents changes in market
24 conditions between the time of the entry of an order by Mr.
25 Pacilio and a cancellation by Mr. Pacilio for the questioned

1 trades that are contained in the government's 1 to 72
2 episodes.

3 Q. Okay.

4 And it goes on for -- this is like a spreadsheet that
5 goes on for several pages?

6 A. Correct.

7 Q. All right.

8 And this is the 1 to 72 episodes that the government
9 chose?

10 A. That's right.

11 Q. All right.

12 I just want --

13 A. That Mr. Pacilio was involved in.

14 Q. Only Mr. Pacilio?

15 A. Correct.

16 Q. Okay.

17 MR. MENCHEL: I'm getting a little bit of feedback
18 here.

19 BY MR. MENCHEL:

20 Q. I just want to pick a couple here. If we can go to No.
21 26.

22 MR. MENCHEL: Abbie, if you can highlight the first
23 row there, please.

24 BY MR. MENCHEL:

25 Q. So, 26 refers to the episode that's in the DOJ's episodes;

1 is that right?

2 A. Yes, that's right.

3 Q. Okay.

4 And what does this data show?

5 A. It shows that this was an order that was open for, under
6 the duration column, 3.486 seconds. And it shows what
7 happened during those 3.486 seconds in terms of changes in
8 market conditions, the last three columns on the exhibit.

9 Q. And what does that tell you?

10 A. It tells you that for that 3. -- during that 3.486
11 seconds, there were 212 market updates, 63 trades and 98
12 contracts traded.

13 Q. And how is the fact that all this activity is going on in
14 the market in literally milliseconds relevant to your opinion
15 here?

16 A. It's relevant because it demonstrates that a lot of times
17 contracts are traded in a very short period of time, not
18 because of a pre-existing plan to cancel the contract, but
19 rather because events changed. Events change very rapidly in
20 this market, and this is a good example of what happened in
21 this -- within a 3.486-second period.

22 Q. Now, Professor, we're getting to the end of your
23 testimony.

24 You previously testified that there were many
25 visible/iceberg episodes involving Mr. Pacilio with different

1 outcomes?

2 Do you recall that?

3 A. Yes.

4 Q. Have you prepared an exhibit providing some examples of
5 these episodes?

6 A. Yes.

7 MR. MENCHEL: I'd like to admit, your Honor,
8 Defendants' Exhibit 193. I understand there's no objection.

9 THE COURT: Defendants' Exhibit 193 is admitted in
10 evidence.

11 (Defendants' Exhibit No. 193 received in evidence.)

12 MR. MENCHEL: And, Abbie, if you could go, please, to
13 the episode September 22nd, 2009.

14 BY MR. MENCHEL:

15 Q. Are you familiar with this example?

16 A. Yes.

17 Q. Now, just so the jury understands, these are charts that
18 you and your folks at Compass Lexecon prepared that look, at
19 least graphically, similar to the government's examples in
20 terms of how they're laid out in format; is that right?

21 A. That's correct.

22 Q. And can you explain to us, just using this -- I'm not
23 going to walk through probably more than three or four of
24 these. But can you explain, by using this one as an example,
25 what this episode depicts and how it's relevant to your

1 opinion?

2 A. All right.

3 Well, this is an example chosen from the larger set,
4 the more complete set of transactions that I've been
5 testifying about.

6 Q. And does it start with the placement of an iceberg order?

7 A. Yes. That's the green line on the top --

8 Q. What happened?

9 A. -- and the green box.

10 Well, there was an order to sell 25 contracts. This
11 is the iceberg order. And, actually, I think it's helpful to
12 also just flash down to the bottom, as well.

13 Q. What part do you want to look at?

14 A. I'm sorry, the red line, the visible order.

15 There's a visible order that's placed to buy 105
16 contracts during the time that the iceberg order is open. In
17 all of the government exhibits like this, what happened was
18 the iceberg filled, and the visible order was then canceled.

19 But here, if you look at the green line at the top --
20 and this is really the relevant point -- the most relevant
21 point, is even though there is a large visible order that's
22 open during the time that the iceberg order is open, what
23 happened in this example is that the iceberg did not fill.
24 The iceberg was canceled. And that is a frequent pattern, but
25 a pattern that did not exist in any of the government's 1 to

1 72 episodes.

2 Q. So, in this instance, were there any fills on either side?

3 A. No. And also relevant with respect to the visible order,
4 the visible order remained here open for more than five
5 seconds. Again, inconsistent with the government episodes.

6 Q. Well, why can't the government just argue, look, we just
7 picked the episodes where the spoofs happened; this is a
8 failed spoof?

9 A. Well, I'm not going to comment on what the government can
10 argue. But the issue is, from my perspective, is you have one
11 action in response to the placement of an iceberg. The
12 government claims that every time there is the placement of a
13 visible order opposite an iceberg, the same thing happens like
14 clockwork, to use the government's example, that the iceberg
15 fills and the visible order is canceled.

16 And that is the pattern in the government's episodes
17 1 to 72. But that is not the pattern -- there are many
18 patterns that exist if you look at the full set of data.

19 And the purpose of this graph designed to look
20 identical to the government graphs is to show, again, the
21 biased and non-representative sample that the government chose
22 because you can create the exact same graphs but get very,
23 very different answers if you look at the full set of data.

24 Q. Okay.

25 Let's go to another one, please, January 4th, 2010.

1 And, again, just for clarity of the record, this is an episode
2 that Compass Lexecon constructed using the same criteria that
3 the government used; is that right?

4 A. That's right.

5 Q. Can you show us what's going on here, please?

6 A. Again, the green line at the bottom is a large iceberg
7 order to buy 18 contracts. And the -- if you look at the
8 ultimate outcome, the iceberg is not ever executed. It's
9 canceled.

10 But this -- in this episode, if you look at the red
11 on the top, during the time that the iceberg was open, some of
12 the visible orders executed, but the iceberg canceled. Again,
13 that's the opposite of the government's pattern, again
14 demonstrating that there are many patterns.

15 Q. So, is this an example where Mr. Pacilio -- it's a large
16 order, right? It's 325 contracts?

17 A. That's right.

18 Q. And in the government's episodes, you saw examples of
19 orders just as large?

20 A. Correct.

21 Q. And is this an example where, rather than pushing the
22 market away from Mr. Pacilio, the market came to him and
23 contracts were sold?

24 A. Correct. And the iceberg canceled.

25 Q. And the iceberg canceled with nothing?

1 A. Right.

2 MR. MENCHEL: Go to the next one, please.

3 BY MR. MENCHEL:

4 Q. This is December 15th, 2009. What does this demonstrate,
5 Professor Fischel?

6 A. It's really the same idea, again, of just looking at all
7 of the data but creating the same type of graphs. You can get
8 very different answers.

9 Here, you have the green line at the top is an
10 iceberg to sell ten contracts. The iceberg, again, never
11 executed. No iceberg -- no part of the iceberg order was ever
12 part of an execution. But you can see all the red at the
13 bottom, that there were 15 visible orders that were placed
14 during the time that the iceberg was open. And some of the
15 visible orders executed. None of the visible -- none of the
16 iceberg order executed, notwithstanding the fact that the 15
17 visible orders were all placed during the time that the
18 iceberg was open.

19 Again, a very different pattern than you can see from
20 the government's illustrations of -- in the same type of
21 graphs.

22 Q. So, here's an example where Mr. Pacilio is placing large
23 visible orders to buy 170 contracts; and rather than the
24 market moving away to the iceberg, he's getting executions?

25 A. That's correct.

1 Q. Does the fact that the pattern can be just the opposite
2 have any relevance to you as to whether or not one can or
3 cannot infer the intent of what's in the trader's mind at the
4 time the trader places these orders?

5 A. Yes, it has significance to me.

6 Q. How so?

7 A. Because you have all different outcomes. You have all
8 different types of traders, all different types of situations.
9 There is no one pattern that occurs like clockwork. You have
10 many, many different patterns; and, therefore, it is, in my
11 opinion, not correct to look at one of the many different
12 patterns and say that that is what was in the mind of the
13 trader the whole time, as opposed to just as easily saying
14 that the trader had the intent to do something else when they
15 have some other outcome.

16 Q. Let's just do one last one. This will be November 5th,
17 2010.

18 Can you explain to us what's going on in this one,
19 Professor?

20 A. Again, you have the green line is the iceberg order to buy
21 25 contracts. Again, you have a situation where the iceberg
22 is canceled even though there are large visible orders that
23 are in the market at a time that's opposite from the
24 iceberged -- the iceberg. And, again, some of the visible
25 orders execute. None of the iceberg executes. Again, the

1 exact opposite pattern of the four-step fraudulent scheme.

2 Q. And I lied. I want to do one last one. Didn't see it in
3 my outline.

4 Let's just go to January 24th, 2011. We have
5 prepared two versions of this. One is a longer view, if you
6 will, and then we have a blowup within it. So let's just
7 stick with the first one.

8 It's a little hard to tell because of all the
9 compression of the data, but what is going on here? We'll
10 talk about it in more detail in a moment.

11 A. Well, again, the green line is the iceberg order to sell
12 25 contracts. And, again, no execution of the iceberg order
13 during all the time that the visible orders are placed in the
14 market.

15 Q. Let's go to the blowup --

16 MR. MENCHEL: Zoom out or zoom in, if you will, on
17 the next one so we can see this a little bit more carefully,
18 more closely.

19 BY MR. MENCHEL:

20 Q. So, what is this showing us on the visible side, the side
21 that the government is claiming is a spoof?

22 MR. ARMSTRONG: Objection, your Honor. We're not
23 claiming this one's a spoof.

24 THE COURT: Sustained.

25 MR. MENCHEL: I'll withdraw it.

1 BY MR. MENCHEL:

2 Q. What is happening on the side that is the large visible
3 side in this case?

4 A. There is a series of orders that are placed, four visible
5 orders to buy 575 contracts.

6 Q. Let me stop you there. That is a huge number; is it not?

7 A. Yes, that's a very large order.

8 Q. Okay.

9 And --

10 A. Or combination of orders.

11 Q. -- what happens as a result of placing that large order?

12 Does it move the market all the way into the iceberg?

13 A. No.

14 Q. What does it do?

15 A. Well, the opposite. One of the orders has executions, and
16 37 contracts were, in fact, executed. But none of the iceberg
17 was executed. Again, the exact opposite of the pattern of the
18 government's four-step alleged fraudulent scheme.

19 Q. So, just to sum it up, based on all of the data that you
20 looked at, both the government's selected episodes and the
21 overall trading pattern, what are your ultimate conclusions in
22 this case?

23 A. My ultimate conclusion basically is what I've said
24 numerous times, that the government's four-part -- four-step,
25 I should say -- alleged fraudulent scheme that it's claimed --

1 that's claimed to work like clockwork is based on a biased and
2 misleading selection of the data, a classic example of
3 selection bias and cherry-picking. And if you look at the
4 full set of data, you reach a very different conclusion.

5 Q. And is one able, looking at the full set of data, to come
6 up with a single reason why a trader would place a large
7 visible order opposite an iceberg?

8 A. No, because of all the different outcomes that can occur.

9 MR. MENCHEL: I pass the witness, your Honor.

10 THE COURT: All right.

11 Ladies and gentlemen, at this time, we'll take our
12 lunch break. We'll break till 1:00 o'clock. During the
13 break, please do not discuss this case with anyone, including
14 one another. And please do not do any independent research
15 regarding any of the issues in this case.

16 Thank you very much.

17 (Jury out.)

18 THE COURT: How long do you think the cross will be
19 at this point?

20 MR. ARMSTRONG: Yeah, longer than I expected
21 yesterday. Probably hour-and-a-half. Absolute most
22 hour-and-a-half. Hopefully less, much less.

23 THE COURT: Okay.

24 Will Mr. Bases' counsel have any examination?

25 MS. PORTER: No.

01:23:03 1 THE COURT: All right. Very good.

01:23:06 2 MR. MENCHEL: Go get him?

01:23:07 3 THE COURT: Anything else?

01:23:08 4 MR. ARMSTRONG: So, your Honor, just to make sure

01:23:10 5 we're not running afoul of your Honor's guidance, can we ask

01:23:13 6 him: You know, hypothetically, if Mr. Pacilio says that he

01:23:16 7 was spoofing the gold, would that have been relevant to your

01:23:19 8 opinion?

01:23:19 9 THE COURT: Yes.

01:23:20 10 MR. ARMSTRONG: Okay. Great. Thank you.

01:23:23 11 MR. MENCHEL: Should we go get him?

01:23:26 12 THE COURT: Yes, please.

01:23:30 13 Let's get the jury.

01:25:50 14 (Jury in.)

01:25:51 15 THE COURT: All right, ladies and gentlemen, I hope

01:25:52 16 you had a good lunch break.

01:25:54 17 We will now proceed with the cross-examination of

01:25:57 18 Professor Fischel.

01:25:59 19 Mr. Armstrong, your witness.

01:26:02 20 MR. ARMSTRONG: Thank you, Judge.

21 DANIEL FISCHEL, DEFENDANT PACILIO'S WITNESS, PREVIOUSLY SWORN

22 CROSS-EXAMINATION

23 BY MR. ARMSTRONG:

24 Q. Professor, good afternoon.

01:26:06 25 A. Good afternoon.

01:26:24 1 Q. Now, Professor, when you testified on direct, you
01:26:27 2 mentioned you were the professor -- I'm sorry, the chairman
01:26:30 3 and the president of Lexicon, right?
01:26:32 4 A. That's correct.
01:26:32 5 Q. And that is your company, right?
01:26:33 6 A. Well, I mean, I don't own it, but I'm the chairman and the
01:26:38 7 president of it.
01:26:39 8 Q. Is there anybody above you in the hierarchy?
01:26:43 9 A. No.
01:26:43 10 Q. So, you're the boss?
01:26:47 11 A. It's not really run that way, but I have the highest
01:26:51 12 title. I have overall responsibility for the firm.
01:26:52 13 Q. Now, over the years, you've worked on several cases where
01:26:56 14 you've defended people who have been alleged to have spoofed,
01:26:59 15 right?
01:27:04 16 A. Well, I testified in one case, and I've had some
01:27:09 17 involvement in some others, that's correct.
01:27:10 18 Q. Okay.
01:27:10 19 And, so, you have worked to defend at least two
01:27:14 20 individuals or entities who have been charged by the United
01:27:17 21 States with spoofing, right?
01:27:18 22 A. Well, in terms of testimony, it was a preliminary hearing,
01:27:32 23 but I guess you could say yes. I certainly was --
01:27:36 24 Q. Would it be helpful --
01:27:36 25 A. -- adverse to the Commodity Futures Trading Commission.

01:27:39 1 Q. Would it be helpful to break it down for you?

01:27:42 2 THE COURT: I think it would help me if you broke it
01:27:45 3 down.

01:27:45 4 MR. ARMSTRONG: Sure.

01:27:45 5 THE COURT: Thank you.

6 BY MR. ARMSTRONG:

01:27:47 7 Q. So, Professor, you have been involved in a case where the
01:27:49 8 United States charged someone named -- a Mr. Vorley with
01:27:53 9 spoofing, right?

01:27:54 10 A. In a very minimal way, that's correct.

01:27:56 11 Q. And your minimal involvement with that involved analyzing
01:28:01 12 trade data, right?

01:28:02 13 A. Well, I wasn't a witness in the case, and I didn't do very
01:28:09 14 much. And I think I talked to some of the lawyers and some of
01:28:12 15 the people at our firm, but I actually don't think I analyzed
01:28:16 16 any trading data.

01:28:16 17 Q. Okay.

01:28:17 18 And you were paid for your time and your work in the
01:28:19 19 Vorley case, right?

01:28:20 20 A. That's correct.

01:28:20 21 Q. How much were you paid in the Vorley case?

01:28:24 22 A. I don't know.

01:28:26 23 Q. Can you ballpark it?

01:28:31 24 MR. MENCHEL: Judge, can we have a sidebar on this?

01:28:40 25 (Proceedings had at sidebar:)

01:28:43 1 MR. MENCHEL: This strikes me as the kind of thing I
01:28:46 2 thought we had an issue with another witness who was going to
01:28:49 3 testify about whether or not they could just bring out all the
01:28:52 4 times he's represented other individuals.

01:28:54 5 If they want to ask obviously what he got paid in
01:28:57 6 this case, which I've already fronted, and they want to break
01:29:00 7 that down, I don't have an objection. But why are we going
01:29:03 8 through every single time this man has been hired to represent
01:29:06 9 somebody with similar charges?

01:29:08 10 THE COURT: Objection overruled.

01:29:09 11 MS. PORTER: Judge -- your Honor, if I may on behalf
01:29:10 12 of Mr. Bases.

01:29:11 13 I don't know what other questions Mr. Armstrong is
01:29:13 14 going to ask, but it's one thing to elicit that this witness
01:29:19 15 has been involved in spoofing cases. I don't think it's
01:29:22 16 appropriate to elicit the criminal cases or that the United
01:29:27 17 States has charged other people with spoofing or certainly
01:29:30 18 what the results of those cases were.

01:29:33 19 He hasn't done it yet, but I didn't want to interrupt
01:29:35 20 and just wanted -- and also names. Mr. Vorley, that name has
01:29:38 21 come up in the evidence in this case. The names don't seem
01:29:41 22 relevant.

01:29:43 23 THE COURT: Certainly I don't think Mr. Armstrong is
01:29:48 24 going to talk about the verdicts in those cases, and he
01:29:53 25 shouldn't.

01:29:54 1 With regard to the names, they are what they are, and
01:29:59 2 this witness testified or was retained for those proceedings.
01:30:03 3 So, objection is overruled.

4 (Proceedings had in open court:)

01:30:13 5 BY MR. ARMSTRONG:

01:30:13 6 Q. So, Professor Fischel, I think that we left off on the
01:30:15 7 amount of money you were paid for your work defending an
01:30:18 8 individual charged with spoofing, right?

01:30:21 9 MR. MENCHEL: Objection to the characterization
01:30:23 10 "defending." That's not accurate.

01:30:28 11 THE COURT: Sustained.

01:30:29 12 Please rephrase.

13 BY MR. ARMSTRONG:

01:30:31 14 Q. Professor, I think we left off, and you were going to tell
01:30:33 15 the jury the amount of money you got paid in the Vorley case,
01:30:37 16 right?

01:30:39 17 A. And the answer is I don't know because, as I said, I
01:30:42 18 wasn't a witness. I was never scheduled to be a witness. I
01:30:47 19 wasn't directly involved. I had some involvement, but very
01:30:51 20 minimal involvement.

01:30:51 21 Q. And you were a consultant, right?

01:30:54 22 A. As I said, I remember speaking to several of the lawyers
01:30:58 23 several times and also communicating with some of our people
01:31:05 24 who had some involvement in the case.

01:31:08 25 Q. Were you getting paid to talk? What did you actually do?

01:31:10 1 A. Yes, I certainly got paid for my time.

01:31:13 2 Q. For, what?

01:31:16 3 MR. MENCHEL: Objection.

01:31:18 4 THE COURT: Sustained.

5 BY MR. ARMSTRONG:

01:31:22 6 Q. And you just don't know how much you got paid; is that

01:31:25 7 right?

01:31:25 8 A. Certainly from memory, I do not know how much I got paid.

01:31:28 9 Q. Now, are you also familiar with the -- I'm going to

01:31:35 10 butcher the pronunciation -- Oystacher case?

01:31:38 11 A. Yes.

01:31:39 12 Q. Was I saying it right?

01:31:40 13 A. I don't know. I'm not sure I ever learned to pronounce it

01:31:43 14 myself. I call it the 3 Red case, and I'm very familiar with

01:31:46 15 that.

01:31:47 16 Q. 3 Red case. The number 3 and the color red?

01:31:50 17 A. Yes.

01:31:50 18 Q. All right.

01:31:51 19 And that was another case where the CFTC charged

01:31:54 20 individuals with spoofing, right?

01:31:57 21 A. That's correct.

01:31:57 22 Q. And in that case, you crunched data at Lexecon, right?

01:32:01 23 A. Yes, we did.

01:32:02 24 Q. And you analyzed data, right?

01:32:04 25 A. That's correct.

01:32:05 1 Q. And you made a whole bunch of charts, right?

01:32:08 2 A. Correct.

01:32:08 3 Q. And you actually testified in that case, right?

01:32:11 4 A. That's right.

01:32:11 5 Q. And you used some of the same terms that you used today,

01:32:14 6 right?

01:32:16 7 A. That's possible. I mean, there are only so many terms

01:32:20 8 that apply to this kind of data. So, I probably did.

01:32:24 9 Q. So, you testified all about selection bias, right?

01:32:27 10 A. Yes, I did.

01:32:28 11 Q. And you talked about confirmation bias, right?

01:32:31 12 A. That's correct.

01:32:31 13 Q. You talked about how the data was fundamentally flawed,

01:32:34 14 right?

01:32:34 15 A. Correct.

01:32:35 16 Q. And how much were you paid in that case?

01:32:40 17 A. You know, I think that was, like, five years ago or

01:32:42 18 something. You could tell me what the date was, but it was a

01:32:46 19 number of years ago.

01:32:47 20 So, I mean, I was very involved in that case. So,

01:32:50 21 I'm sure I got paid a significant amount, but I have no idea

01:32:54 22 how much that was as I sit here today.

01:32:56 23 Q. Do you think it was more or less than you got paid in this

01:32:59 24 case?

01:33:00 25 A. I don't know.

01:33:01 1 Q. And, in fact, the same individual asking you questions in
01:33:04 2 that case was Mr. Menchel, right?

01:33:06 3 A. Yes, that's correct.

01:33:07 4 Q. And, so, you guys ran through the same general topics that
01:33:10 5 you ran through today, right?

01:33:12 6 MR. MENCHEL: Objection.

01:33:13 7 THE COURT: Overruled.

8 BY THE WITNESS:

01:33:17 9 A. Well, it's the same type of a case, but obviously exactly
01:33:24 10 what -- the questions that were asked and the answers that I
01:33:27 11 gave were tailored to the facts and circumstances of that
01:33:31 12 case.

13 BY MR. ARMSTRONG:

01:33:31 14 Q. But the point was you attacked the CFTC's expert as having
01:33:34 15 a fundamentally flawed opinion about spoofing, didn't you?

01:33:38 16 A. Yes, I did.

01:33:39 17 Q. And, then, after that, the judge issued a ruling, right?

01:33:44 18 A. Correct.

01:33:44 19 MR. MENCHEL: Objection, Judge.

01:33:48 20 Can we have a sidebar on this?

01:33:49 21 THE COURT: Sidebar.

01:33:56 22 (Proceedings had at sidebar:)

01:33:57 23 MR. ARMSTRONG: Your Honor, I'm going to elicit from
01:33:59 24 this witness that at the conclusion of that same testimony
01:34:01 25 that he provided, the judge in that case said that he placed

01:34:05 1 heavy focus on the individual factors related to the spoofing
01:34:09 2 mechanisms but often ignored the impact of all these factors
01:34:12 3 in the aggregate.

01:34:14 4 It directly rebuts there's only one way to do this,
01:34:16 5 that he is the authority on this.

01:34:18 6 THE COURT: So, the judge in that case issued an
01:34:25 7 opinion, and in what procedural context was that opinion
01:34:32 8 issued?

01:34:32 9 MR. ARMSTRONG: It was in the context of a
01:34:33 10 preliminary injunction requested by the CFTC against the two
01:34:38 11 individuals that we just mentioned, Oystacher and 3 Red. And
01:34:51 12 the professor gave the same testimony that he gave today,
01:34:51 13 about selection bias, criteria bias, fundamentally flawed
01:34:51 14 analysis; and the judge said, no, I completely disagree with
01:34:51 15 this.

01:34:51 16 THE COURT: Well, what exactly did the judge say?

01:34:54 17 MR. ARMSTRONG: The judge said in the opinion --

01:34:56 18 MS. PORTER: I'm sorry to interrupt. I'm sure it's
01:34:58 19 not intentional, but it's very easy to hear you, Mr.
01:35:00 20 Armstrong, over the noise.

01:35:02 21 MR. ARMSTRONG: Judge, I have a copy, if you want me
01:35:05 22 to hand you up a copy.

01:35:08 23 MR. MENCHEL: Do you have a copy for me?

01:35:10 24 (Document tendered to the Court.)

01:37:10 25 (Brief pause.)

01:37:10 1 THE COURT: The objection is sustained. I'm not
01:37:15 2 going to let you go into what the judge in this case
01:37:18 3 determined, given the -- it's just not clear to me from the
01:37:23 4 case that the criticisms that Professor Fischel had with
01:37:32 5 regard to Professor Bessembinder in the United States
01:37:40 6 Commodity Futures Trading Commission, while they might be,
01:37:43 7 writ large, at a 40,000-foot level be similar to his analysis
01:37:48 8 here, it's not -- it's clear that Professor Bessembinder was
01:37:55 9 taking a different approach than the one that Professor
01:38:00 10 Fischel is addressing in this case.

01:38:02 11 And, so, to the extent it has any relevance, I think
01:38:08 12 it should be barred under Rule 403 because I think it is
01:38:11 13 unduly prejudicial to defendants, and that prejudice
01:38:14 14 substantially outweighs whatever probative value it may have,
01:38:19 15 and I think it has minimal.

01:38:28 16 (Proceedings had in open court:)

01:38:28 17 MR. ARMSTRONG: May I proceed, your Honor?

01:38:45 18 Thank you.

19 BY MR. ARMSTRONG:

01:38:51 20 Q. So, Professor, this is now your third occasion on which
01:38:53 21 you have defended individuals charged with spoofing, right?

01:38:58 22 MR. MENCHEL: Objection to the characterization of
01:38:59 23 "defending."

01:39:00 24 MR. ARMSTRONG: I'm sorry. Individuals.

01:39:01 25 THE COURT: Sustained.

01:39:03 1 Hold on. Can you rephrase the question, please?

01:39:05 2 MR. ARMSTRONG: Of course.

3 BY MR. ARMSTRONG:

01:39:07 4 Q. Now, Professor, this is your third time where you've been
01:39:09 5 involved with individuals who have been alleged to have
01:39:13 6 spoofed, right?

01:39:14 7 A. You know, all three are very different; but in some way,
01:39:17 8 yes, that's correct.

01:39:22 9 MR. ARMSTRONG: Now, can I have the Elmo, your Honor,
01:39:24 10 please.

11 BY MR. ARMSTRONG:

01:39:30 12 Q. Now, Professor, how much has your company billed in this
01:39:33 13 case?

01:39:33 14 A. I think I said I believe it's \$4.6 million.

01:39:39 15 Q. And that has involved work with the data, right?

01:39:46 16 A. Most of it is work with the data, correct.

01:39:48 17 Q. And it's also involved part of your opinion here today,
01:39:51 18 right?

01:39:51 19 A. Correct.

01:39:51 20 Q. Now, have you been paid or has your company been paid that
01:39:56 21 full amount yet?

01:39:57 22 A. The full amount, probably not just because of the timing
01:40:01 23 of when bills go out.

01:40:03 24 Q. Do you know how much your company had been paid as of July
01:40:07 25 15th, 2021?

01:40:10 1 A. Not from memory, no.

01:40:13 2 MR. ARMSTRONG: May I approach, your Honor?

01:40:14 3 THE COURT: You may.

01:40:18 4 BY MR. ARMSTRONG:

01:40:21 5 Q. Sir, if I could direct your attention to Paragraph 3 of

01:40:23 6 this document.

01:40:25 7 (Document tendered.)

01:40:29 8 BY MR. ARMSTRONG:

01:40:31 9 Q. And please let me know when you've read it.

01:40:35 10 (Brief pause.)

01:40:37 11 BY THE WITNESS:

01:40:38 12 A. I've read it.

01:40:41 13 BY MR. ARMSTRONG:

01:40:44 14 Q. Okay.

01:40:48 15 Does that refresh your memory that your company has

01:40:50 16 been paid about --

01:40:52 17 MR. MENCHEL: Objection to the form of the question.

01:40:55 18 THE COURT: Overruled.

01:40:58 19 BY MR. ARMSTRONG:

01:40:60 20 Q. Does that refresh your memory, sir, that your company's

01:40:62 21 been paid about \$2.8 million so far?

01:40:65 22 A. Yes. But it doesn't refresh my memory because I didn't

01:40:68 23 know it before.

01:40:71 24 Q. You have no reason to disagree with it, right?

01:41:02 25 A. No. I'm sure it's accurate.

01:41:05 1 Q. So, you've only been paid -- your company, that is -- \$2.8
01:41:11 2 million, right?

01:41:13 3 A. I don't know if that's true as of today, but it was true
01:41:16 4 as of the date of that letter.

01:41:18 5 Q. Now, you've got to help me. So 4.6 million minus 2.8
01:41:23 6 million is about, what?

01:41:25 7 A. 1.8 million.

01:41:26 8 Q. \$1.8 million.

01:41:29 9 So, your company is still owed \$1.8 million, right?

01:41:35 10 A. As I said, I don't know if that's right.

01:41:37 11 Q. Well, you have no reason to disagree with it, correct?

01:41:40 12 A. I don't have any reason to either agree or disagree.

01:41:44 13 Q. And do you know who pays your bills?

01:41:47 14 A. Actually, no, I don't.

01:41:49 15 Q. You don't know if it's Mr. Menchel or any of the attorneys
01:41:51 16 in this case?

01:41:52 17 MR. MENCHEL: I wish.

01:41:54 18 (Laughter.)

19 BY THE WITNESS:

01:41:57 20 A. I don't know. I don't send out the bills. I don't
01:41:59 21 receive payment for the bills. But I'm confident it was not
01:42:05 22 money that Mr. Menchel paid to us.

23 BY MR. ARMSTRONG:

01:42:08 24 Q. So, at some point you're going to leave the witness
01:42:11 25 stand -- hopefully soon -- you're going to walk out the door,

01:42:14 1 and somebody is going to pay you \$1.8 million, right?

01:42:18 2 A. Well, first of all, the payment is not to me. It's a bill
01:42:20 3 sent out by the firm, paid to the firm. And hopefully, yes, I
01:42:25 4 hope we'll be paid in full.

01:42:29 5 Q. Do you have any idea when that will be?

01:42:32 6 A. I mean, I hope soon, but I haven't had any discussions
01:42:36 7 about it, so I don't know.

01:42:37 8 Q. So, it's possible that you could just walk out and someone
01:42:39 9 will give you a check for \$1.8 million to the company?

01:42:42 10 MR. MENCHEL: Objection.

01:42:42 11 THE COURT: Sustained.

12 BY MR. ARMSTRONG:

01:43:01 13 Q. Now, Professor --

01:43:02 14 MR. ARMSTRONG: May I approach, your Honor?

01:43:04 15 BY MR. ARMSTRONG:

01:43:04 16 Q. Now, Professor, you talked at length about the options
01:43:07 17 that might happen after a large order is placed in the market,
01:43:11 18 right?

01:43:11 19 A. That's correct.

01:43:11 20 Q. And the first option was that -- I think you called it
01:43:15 21 front-running?

01:43:16 22 A. Correct.

01:43:16 23 Q. So, basically you put in a buy order; other people in the
01:43:22 24 market might put in more buy orders, right?

01:43:24 25 A. Correct.

01:43:25 1 Q. And in that situation, generally speaking, the price would
01:43:32 2 go up, right?

01:43:32 3 A. If it's a buy order, that's right.

01:43:34 4 Q. And the second option could be that people would put in a
01:43:38 5 sell order and actually trade with the large order, right?

01:43:41 6 A. That's correct.

01:43:41 7 Q. So, traders sell, buy, right?

01:43:56 8 Now, if you're trying to spoof, obviously -- and you
01:44:00 9 have a sell order up here, obviously, outcome 1 is a good
01:44:05 10 outcome for you, right?

01:44:07 11 A. If you're trying to -- if you're trying to spoof and have
01:44:14 12 an execution on your -- is that an iceberg --

01:44:17 13 Q. Correct.

01:44:17 14 A. -- on the top there?

01:44:19 15 Yes, that would be a good outcome.

01:44:20 16 Q. That would be a really good outcome because what would
01:44:23 17 happen is the price from the large buy order would jack up the
01:44:26 18 price so you could get a fill at the price you want, right?

01:44:31 19 A. That could happen, certainly.

01:44:33 20 Q. But the other outcome in outcome 2 is that other traders
01:44:38 21 in the market could hit the spoof, right?

01:44:40 22 A. Well, I wouldn't presume it's a spoof unless you're asking
01:44:46 23 me to assume it's a spoof. I mean --

01:44:48 24 Q. So, hypothetically, in the situation if the large order is
01:44:53 25 a spoof order, the first option is that you could jack up the

01:44:56 1 price and help your sell side order, right?

01:44:59 2 A. That's right.

01:45:00 3 Q. But the other option is that this is a spoof order, other
01:45:05 4 people in the market could hit the spoof order, right, and
01:45:07 5 actually execute on it?

01:45:09 6 A. Well, unless you're asking me to assume it's a spoof
01:45:12 7 order, there's no reason to believe in that scenario in option
01:45:16 8 2, or for that matter even in option 1, that it's a spoof
01:45:20 9 order.

01:45:20 10 Q. I'm just asking you hypothetically, sir, okay?

01:45:24 11 So, hypothetically, if the large order is a spoof
01:45:28 12 order, the second option would be that traders could actually
01:45:30 13 hit the spoof, right?

01:45:33 14 A. If you're asking me to assume that, yes, that would be a
01:45:36 15 failed spoof.

01:45:38 16 Q. Okay.

01:45:38 17 And have you heard the term "hit the spoof" before?

01:45:42 18 A. Yes.

01:45:42 19 Q. And, so, you know what I'm talking about, right?

01:45:46 20 A. I know exactly what you're talking about.

01:45:57 21 MR. ARMSTRONG: And, Mr. Fineman, if you can please
01:45:59 22 pull up for demonstrative purposes GX 49 -- 249 and Page 1741,
01:46:15 23 please, Mr. Fineman.

24 BY MR. ARMSTRONG:

01:46:24 25 Q. Sir, do you recognize what's on the screen is your

01:46:26 1 testimony from yesterday?

01:46:27 2 A. Yes, sir, I do.

01:46:27 3 MR. ARMSTRONG: Permission to publish, your Honor?

01:46:29 4 THE COURT: Any objection?

01:46:31 5 MR. MENCHEL: I've never heard of it -- oh,

01:46:33 6 published? No. No objection to being published. I

01:46:43 7 apologize.

8 BY MR. ARMSTRONG:

01:46:43 9 Q. Now, Professor, you said yesterday: "But if you go back
01:46:46 10 and look at the government's four-part scheme, it only has one
01:46:49 11 of these alternatives."

01:46:51 12 So, we're talking about step one that I wrote on the
01:46:54 13 board, right?

01:46:58 14 A. Yes, that's right.

01:46:59 15 Q. And the government says: "That that one alternative
01:47:04 16 happens every time, like clockwork.

01:47:06 17 And you said: "That is false. That is a
01:47:08 18 misrepresentation of the relevant trading data, and that is a
01:47:11 19 misrepresentation of the academic literature on trading
01:47:15 20 behavior. And it's certainly a misrepresentation of the
01:47:18 21 experience of what happens in the market over that period I've
01:47:21 22 investigated when Mr. Pacilio places a large visible
01:47:25 23 opposite -- large visible order opposite the iceberg?"

01:47:27 24 Do you see that?

01:47:28 25 A. Yes, that's exactly what I said.

01:47:32 1 Q. But did you actually sit through trial in this case?

01:47:35 2 A. No, I did not.

01:47:36 3 Q. You were allowed to, right?

01:47:37 4 A. I assume so. It's a public trial. But I didn't
01:47:43 5 investigate whether I was allowed to or not.

01:47:44 6 Q. And, so, you accused the government of misleading the jury
01:47:47 7 without even bothering to sit through trial?

01:47:51 8 A. I based my opinions on the data analysis that I did, and I
01:47:59 9 felt that was a sufficient basis to express the opinions that
01:48:02 10 I expressed.

01:48:02 11 Q. You don't think it would have been helpful to sit through
01:48:07 12 the trial and actually hear the evidence about what the
01:48:10 13 government told the jury?

01:48:13 14 A. For my purposes, as I said, I think what I did was
01:48:18 15 sufficient for me to form the opinions and the testimony that
01:48:21 16 I gave.

01:48:21 17 Q. So, you don't know, because you didn't sit through trial,
01:48:29 18 how many times the government showed the jury when the spoof
01:48:33 19 orders got hit in option 2, do you?

01:48:36 20 A. No, I don't.

01:48:36 21 Q. Do you want to amend your testimony from yesterday?

01:48:45 22 A. No, I don't.

01:48:46 23 Q. What were you doing, instead of sitting through trial, the
01:48:55 24 testimony that you were going to provide in this case --

01:48:57 25 MR. MENCHEL: Object- -- sorry, let him finish.

01:49:00 1 THE COURT: Sustained.

01:49:00 2 Please rephrase.

3 BY MR. ARMSTRONG:

01:49:02 4 Q. Were you making charts instead of listening to the
01:49:03 5 testimony?

01:49:05 6 MR. MENCHEL: Objection.

01:49:05 7 THE COURT: Sustained.

8 BY MR. ARMSTRONG:

01:49:13 9 Q. So, you didn't hear Mr. Lakhan testify about the four-part
01:49:17 10 scheme that you called so misleading, right?

01:49:19 11 MR. MENCHEL: Objection, based on the prior argument
01:49:22 12 made earlier. Hypothetical is one thing.

01:49:26 13 THE COURT: Overruled.

14 BY MR. ARMSTRONG:

01:49:27 15 Q. So, Professor, you didn't hear Mr. Lakhan testify at
01:49:32 16 length over two or three days about the four-part scheme that
01:49:35 17 you called so misleading, did you?

01:49:37 18 A. I did not hear him testify. I was not in the courtroom.

01:49:41 19 Q. You had the opportunity to listen to him, right?

01:49:44 20 A. As I said, I don't know what the Court's ruling would have
01:49:48 21 been if I would have wanted to, but I didn't investigate that,
01:49:52 22 so I don't know.

01:49:53 23 Q. Did any of the attorneys sitting over here tell you, in
01:49:56 24 fact, that you were allowed to listen in in all the testimony?

01:50:01 25 A. I don't believe that subject ever came up.

01:50:03 1 Q. Now, after the testimony, did you review the transcripts?

01:50:10 2 A. I reviewed some of the transcripts.

01:50:12 3 Q. But just not Mr. Lakhan's?

01:50:14 4 A. I reviewed some of Mr. Lakhan's.

01:50:15 5 Q. Okay.

01:50:16 6 So, you did see Mr. Lakhan's testimony?

01:50:20 7 MR. MENCHEL: Objection.

01:50:21 8 THE COURT: Overruled.

01:50:23 9 I'm sorry. Sustained.

01:50:24 10 Please rephrase.

01:50:27 11 Do you mean "see" as in read the transcript or "see"
01:50:30 12 as in observe Mr. Lakhan testify?

01:50:34 13 MR. ARMSTRONG: I'll move on, your Honor.

01:50:35 14 THE COURT: Okay.

15 BY MR. ARMSTRONG:

01:50:47 16 Q. So, did you hear Mr. Lakhan describe scenario 2 that you
01:50:52 17 accused the government of not providing to the jury?

01:50:57 18 A. As I've said several times, I did not hear any testimony
01:51:00 19 of Mr. Lakhan because I was not present in the courtroom.

01:51:08 20 Q. Did you hear anyone say in the courtroom "sometimes it
01:51:12 21 works, sometimes it doesn't" in relation to spoof orders?

01:51:18 22 A. I don't recall hearing that or seeing that.

01:51:21 23 Q. That certainly would be relevant to whether the government
01:51:27 24 gave the correct impression to the jury, wouldn't it?

01:51:30 25 A. As I said, for my purposes, I felt the analysis that I

01:51:35 1 performed was a sufficient basis to reach the opinions that I
01:51:39 2 reached and to testify about the subjects that I testified
01:51:43 3 about.

01:51:45 4 Q. So, is it your testimony that it would not be relevant to
01:51:48 5 actually know if the government presented to the jury option 2
01:51:52 6 before you accused the jury -- before you accused the
01:51:55 7 government of misconduct?

01:51:56 8 MR. MENCHEL: Objection. There was no statement of
01:51:58 9 misconduct.

01:52:08 10 THE COURT: Sustained.

01:52:09 11 Please rephrase.

12 BY MR. ARMSTRONG:

01:52:15 13 Q. So, is it your testimony that it would not be relevant to
01:52:18 14 actually know if the government presented to the jury option 2
01:52:22 15 before you accused the government of a misleading narrative?

01:52:30 16 A. Mr. Armstrong, I hate to be personal, but I read your
01:52:33 17 opening statement very carefully, word for word. I read what
01:52:38 18 you said about the four-step scheme. I read that you said it
01:52:42 19 worked like clockwork. Those were your words. And for those
01:52:47 20 reasons -- and that's why I started my testimony with
01:52:51 21 basically my understanding of exactly what you said word for
01:52:55 22 word in terms of what you said to the jury.

01:52:58 23 And I felt my analysis was a fair review of whether
01:53:04 24 or not the evidence supported the statements that you,
01:53:07 25 yourself -- you personally -- made to the jury about what the

01:53:11 1 evidence will show. And I reached the conclusions that I did
01:53:14 2 based on the analysis that I performed.

01:53:17 3 Q. Now, sir, you were a Supreme Court clerk, right?

01:53:19 4 A. Well, yes, a clerk for a Supreme Court justice, that's
01:53:22 5 correct.

01:53:22 6 Q. The highest court in the land, right?

01:53:24 7 A. That's right.

01:53:25 8 Q. And you were a practicing lawyer for a long time, right?

01:53:27 9 A. Not correct.

01:53:28 10 Q. You just practiced in academia?

01:53:31 11 A. I actually was a practicing lawyer for a few months, less
01:53:34 12 than a year, before I accepted a teaching position at
01:53:37 13 Northwestern University.

01:53:39 14 Q. And, so, you know, sir, based on your extensive
01:53:42 15 experience, that what a lawyer says in opening statements is
01:53:46 16 not evidence, right?

01:53:47 17 MR. MENCHEL: Objection, your Honor.

01:53:49 18 THE COURT: Overruled.

19 BY MR. ARMSTRONG:

01:53:53 20 Q. Sir, you know that what a lawyer says to the jury in
01:53:55 21 opening statements is not evidence, right?

01:54:00 22 A. I know it's not evidence. But, I mean, if you're asking
01:54:05 23 me what my understanding is, it is what the proponent of the
01:54:11 24 statement intends to demonstrate what the evidence will show.

01:54:16 25 Q. All right.

01:54:16 1 But the evidence is actually what people say in the
01:54:20 2 witness stand that you're sitting in right now, right?
01:54:22 3 A. That's correct.
01:54:23 4 Q. And that was the same evidence you didn't bother to show
01:54:26 5 up for, right?
01:54:31 6 A. Was that a -- I'm -- I'm sorry, you're asking me a
01:54:36 7 question? I've said several times I was not physically
01:54:39 8 present at -- during the trial except for a very small part of
01:54:42 9 it.
01:54:43 10 Q. Were you in Chicago at the time?
01:54:48 11 MR. MENCHEL: Objection.
01:54:49 12 THE COURT: Sustained.
01:54:51 13 MR. ARMSTRONG: Mr. Fineman, if you can please pull
01:54:54 14 up DX 147.
01:55:00 15 And permission to publish.
01:55:02 16 Thank you.
01:55:07 17 BY MR. ARMSTRONG:
01:55:03 18 Q. Now, Professor, that was the article you showed to the
01:55:06 19 jury, right?
01:55:06 20 A. That's correct.
01:55:07 21 Q. And you read, I think, several paragraphs to the jury,
01:55:09 22 right?
01:55:09 23 A. That's right.
01:55:10 24 Q. And I think you testified that this article was very
01:55:14 25 relevant to your opinions in this case, right?

01:55:17 1 A. Correct.

01:55:23 2 MR. ARMSTRONG: Now, Mr. Fineman, if you can please
01:55:25 3 go to Page 5.

01:55:26 4 And if you can please blow up that paragraph.

5 BY MR. ARMSTRONG:

01:55:29 6 Q. And, sir, can you please just read to the jury the
01:55:31 7 highlighted sentence?

01:55:32 8 A. "We examine traders' order submission strategies for a
01:55:36 9 broad cross-section of Euronext-Paris firms using the Base
01:55:46 10 de Données de Marché database from April 2003."

01:55:48 11 Q. Did you forget to tell the jury that -- when you were
01:55:50 12 reading a lot of this exhibit -- that all the topics you were
01:55:53 13 talking about were about a French exchange from 2003?

01:55:56 14 MR. MENCHEL: Objection to the characterization of
01:55:58 15 the question.

01:56:01 16 THE COURT: Sustained.

01:56:02 17 Please rephrase the question.

18 BY MR. ARMSTRONG:

01:56:05 19 Q. Sir, you didn't tell the jury when you were reading
01:56:09 20 paragraphs of DX 147 that the whole article related to stock
01:56:15 21 trades in Paris in April of 2003, did you?

01:56:18 22 A. I did not mention that in my discussion of the article,
01:56:21 23 correct.

01:56:22 24 Q. Now, sir, you know that this is a case about futures
01:56:25 25 trading in Chicago, right?

01:56:28 1 A. I'm aware of that.

01:56:29 2 Q. And you know that there's not a single trade in this case
01:56:32 3 that goes back to April 2003, right?

01:56:35 4 A. I know that, as well.

01:56:36 5 Q. And, so, you thought it was more relevant to read and
01:56:45 6 study this article than sit through trial?

01:56:51 7 A. I think the article discusses --

01:56:54 8 MR. MENCHEL: Objection. Before the witness answers,
01:56:56 9 objection to the form of this question, your Honor.

01:56:59 10 THE COURT: Sustained.

01:57:00 11 MR. MENCHEL: It's argumentative.

12 BY MR. ARMSTRONG:

01:57:07 13 Q. What is the Base de Données de Marche? What is that?

01:57:14 14 A. I don't know exactly what it is.

01:57:15 15 Q. But that was part of your opinion here today or yesterday,
01:57:23 16 right?

01:57:24 17 A. No. My opinion wasn't based on the database. It was a
01:57:29 18 description of the type of traders that exist in markets,
01:57:33 19 which is not specific to this database or this time period, as
01:57:38 20 is well-known in the economics of trading behavior.

01:57:42 21 Q. But, sir, you know that the defendants in this case didn't
01:57:45 22 trade on whatever this is, the BDM, right?

01:57:49 23 A. Yes, I know that. Well, at least I assume that.

01:58:04 24 Q. Now, sir, you're generally familiar with the term
01:58:07 25 "spoofing," right?

01:58:08 1 A. Yes.

01:58:08 2 Q. And you generally know that spoofing involves placing a

01:58:11 3 trade on one side that you don't intend to actually trade

01:58:15 4 with, right?

01:58:17 5 A. That you don't intend to execute, that's my understanding.

01:58:20 6 Q. And it's often offered, that trade, with the intent to

01:58:25 7 push up or push down prices, right?

01:58:29 8 A. That's the allegation.

01:58:30 9 Q. And that's your understanding, as well, right?

01:58:33 10 A. It's my understanding of the allegation of what spoofing

01:58:37 11 means.

01:58:37 12 Q. Is your testimony that you have no understanding about the

01:58:41 13 purpose of spoofing and how spoofing is intended to push up or

01:58:44 14 push down prices?

01:58:45 15 A. I think I just said that is my understanding of what

01:58:49 16 spoofing means.

01:58:52 17 Q. Outside the allegations of this case, right? It's just a

01:58:56 18 common industry term, right?

01:58:59 19 A. I don't know how common it is, but I'm aware of that usual

01:59:05 20 characterization of what spoofing means outside the context of

01:59:08 21 this case.

01:59:09 22 Q. Okay.

01:59:09 23 Now, going back to the article about the French

01:59:13 24 traders in 2003, based on that article, you described option

01:59:19 25 1, where a large order gets put in and that encourages more

01:59:22 1 buying, right?

01:59:23 2 A. That's right.

01:59:23 3 Q. And you studied how French traders react to that scenario,

01:59:34 4 right?

01:59:34 5 A. I didn't perform any studies myself of how French traders
01:59:37 6 reacted to anything.

01:59:38 7 Q. You told the jury in the demonstrative that we just looked
01:59:41 8 at, DX 147, about how the study examined how French traders
01:59:45 9 react in that exchange, right?

01:59:47 10 A. There was nothing in my testimony about French traders.
01:59:53 11 My testimony dealt with the different categories of traders,
01:59:58 12 which is not limited to this particular time period or this
02:00:04 13 particular exchange. It is a well-known phenomenon in the
02:00:08 14 economics of trading.

02:00:11 15 And my point was to illustrate to the jury that,
02:00:14 16 contrary to your opening statement, there is not only one type
02:00:18 17 of trader or one type of reaction to the placement of a large
02:00:23 18 visible order opposite an iceberg order.

02:00:25 19 Q. And the segment that you read to the jury from that
02:00:33 20 article drew those conclusions from examining the French
02:00:37 21 exchange, right?

02:00:42 22 A. As I keep saying, those conclusions are not based on the
02:00:49 23 French exchange, although they rely on a database from the
02:00:53 24 French exchange. But the three types of traders exist on any
02:00:56 25 exchange.

02:00:57 1 Q. Now, did you actually look and see what the defendants
02:01:05 2 said at the time about how their orders affected the market?
02:01:11 3 A. I'm not sure what you mean.
02:01:13 4 Q. Are you aware of things called Bloomberg chats?
02:01:16 5 A. You mean, the chats in this case?
02:01:19 6 Q. Exactly.
02:01:19 7 A. Yes, I am aware of those.
02:01:21 8 Q. And did you review the chats in this case?
02:01:23 9 A. Yes. Well, I mean, as part of my familiarity with the --
02:01:29 10 or becoming familiar with the background of this case, I did
02:01:32 11 see the chats that were part of the evidence and the
02:01:38 12 allegations in the case.
02:01:38 13 Q. And, so, you, in fact, did review chats in this case as
02:01:46 14 part of your opinion today?
02:01:48 15 A. Not really part of my opinions because I don't have any
02:01:50 16 opinions about the chats. But I am familiar with them.
02:01:53 17 Q. Okay.
02:01:56 18 And, so, you saw in the chats how the defendants
02:02:02 19 described the effect of their large orders on the market,
02:02:06 20 right?
02:02:08 21 A. Again, I don't want to characterize the chats. I don't
02:02:12 22 have any opinion about them. But if you want to show me one,
02:02:17 23 I'll tell you what my understanding of what it means.
02:02:19 24 Q. Sure.
02:02:30 25 MR. ARMSTRONG: Your Honor, if we could please pull

02:02:32 1 up DX 52.

02:02:38 2 And please go to Page 2, Mr. Fineman.

3 GX.

4 BY MR. ARMSTRONG:

02:02:51 5 Q. Now, Professor, you see here in the testimony that was

02:02:54 6 elicited in this case and the evidence in this case:

02:02:57 7 "That was me offering silver to try to buy your 83s?

02:03:02 8 "NP: I thought it was a 50-lot order when I asked

02:03:06 9 you to buy the first 100K.

02:03:08 10 "Didn't get it.

02:03:09 11 "Ha, ha, ha, cheeky monkey."

02:03:12 12 Do you see that?

02:03:13 13 A. I do.

02:03:13 14 Q. Okay.

02:03:18 15 MR. ARMSTRONG: And Page 3, please, Mr. Fineman.

16 BY MR. ARMSTRONG:

02:03:23 17 Q. And you see here Mr. Bases says:

02:03:26 18 "Someone else joining. Wow. My offering that

02:03:33 19 clearly attracted selling."

02:03:34 20 Do you see that?

02:03:34 21 A. I do.

02:03:35 22 Q. Now, what's being described is option 1 that we just went
02:03:40 23 over, isn't it?

02:03:42 24 MS. PORTER: Judge, may I be heard at sidebar,

02:03:44 25 please?

02:03:44 1 THE COURT: You may.

02:03:51 2 (Proceedings had at sidebar:)

02:03:51 3 MS. PORTER: Your Honor, I specifically asked the
02:03:53 4 government before they began their cross-examination if they
02:03:56 5 intended to use any chats involving Mr. Bases, and the only
02:03:58 6 one that Mr. Armstrong identified was the defense exhibit
02:04:02 7 where Mr. Bases said words to the effect of "sometimes it
02:04:05 8 works, sometimes it doesn't."

02:04:08 9 Mr. Bases did not put on a defense case and did not
02:04:11 10 call Professor Fischel. I'm not understanding why, despite
02:04:18 11 the representation, Mr. Armstrong is crossing on words of our
02:04:22 12 client. So, I ask that the chat be taken down and that
02:04:27 13 Mr. Armstrong move on.

02:04:28 14 MR. ARMSTRONG: Your Honor, it was actually a
02:04:31 15 surprise to us that Professor actually looked at chats because
02:04:35 16 it was told to us that he did not.

02:04:37 17 And, so, now we're just probing what exactly he
02:04:41 18 looked at. And he offered to give us his opinion about what
02:04:44 19 the words say, and so we took him at his word.

02:04:47 20 MS. PORTER: Your Honor, neither I nor anyone I'm
02:04:49 21 aware of on Mr. Bases' team made any representations at all.
02:04:53 22 This isn't our witness. And Fischel's opinion about Mr.
02:04:57 23 Bases' chats is not relevant in the case.

02:05:00 24 MR. ARMSTRONG: Your Honor, he's talking to Mr.
02:05:02 25 Pacilio in this chat.

02:05:04 1 THE COURT: All right. The objection is overruled.

02:05:10 2 Mr. Bases' counsel has the ability to cross-examine

02:05:13 3 Dr. Fischel if Mr. Bases wishes to.

02:05:15 4 So, this witness said he looked at chats to get

02:05:22 5 background information to prepare his opinions. He offered to

02:05:27 6 look at some of those chats. The government -- the witness

02:05:30 7 opened the door, and the government can present him with

02:05:34 8 chats.

02:05:38 9 (Proceedings had in open court:)

10 BY MR. ARMSTRONG:

02:05:40 11 Q. So, Professor Fischel, we're still on Page 3 of Government

02:05:46 12 Exhibit 52, and Mr. Bases says: "By offering, that clearly

02:05:50 13 attracted selling."

02:05:51 14 You see that, right?

02:05:53 15 A. I do.

02:05:53 16 Q. And what he's describing, in your expert opinion, is when

02:05:59 17 you put in a large order, that attracts more orders to go the

02:06:03 18 same direction, right?

02:06:12 19 A. Are you still asking me to assume that option 1 is

02:06:15 20 spoofing? Because this does -- I mean, if you're asking me my

02:06:17 21 understanding of this, again, I don't want to comment on the

02:06:20 22 chats. I have no opinion about the chats. It's not part of

02:06:23 23 my opinions.

02:06:24 24 But if you want me to tell you what I think this

02:06:26 25 shows, it doesn't show spoofing by itself for sure because

02:06:31 1 orders can move prices in perfectly legitimate ways. That
02:06:38 2 happens all the time, and it has nothing do, by itself, with
02:06:43 3 any evidence of improper behavior.

02:06:44 4 Q. Okay.

02:06:45 5 And, so, we can agree that sometimes orders move
02:06:47 6 prices, right?

02:06:48 7 A. All the time.

02:06:48 8 Q. Okay.

02:06:50 9 And, so, what is important is actually the intent of
02:06:54 10 the individual who places the order, right?

02:06:58 11 MR. MENCHEL: Objection.

02:06:58 12 THE COURT: Sustained.

13 BY MR. ARMSTRONG:

02:07:14 14 Q. Now, sir, you would agree that in this situation, Mr.
02:07:20 15 Bases is describing how one of his orders attracted more
02:07:25 16 selling, right?

02:07:34 17 A. It says: "Wow. By offering, that clearly attracted
02:07:39 18 selling."

02:07:39 19 Q. And do you know if Mr. Bases, or someone else he was
02:07:42 20 talking to, was on the other side of that and actually had a
02:07:45 21 buy order at the same time?

02:07:47 22 A. No, I don't.

02:07:48 23 Q. Wouldn't that be helpful to know to understand the trade
02:07:55 24 at issue?

02:07:56 25 A. I wasn't trying to understand this particular chat. As

02:07:59 1 I've said several times, I didn't form any opinion about the
02:08:03 2 chats.

02:08:04 3 Q. But you certainly reviewed them, right?

02:08:06 4 A. Again, as part of the background of the case, I became
02:08:10 5 familiar with the fact that there were -- part of the evidence
02:08:15 6 or allegations involved chats and, more specifically,
02:08:21 7 government episodes 51 to 72 were episodes involving chats.

02:08:27 8 But I limited my opinions and my analysis to trading
02:08:33 9 behavior. But, again, if you show me something and you want
02:08:35 10 my opinion, I'll give it to you --

11 Q. So --

02:08:37 12 A. -- but it wasn't part of my analysis.

02:08:39 13 Q. I just want to make sure that I understand now. I'm sorry
02:08:41 14 to interrupt you.

02:08:42 15 So, are you saying that you didn't look at the
02:08:44 16 trading episodes that had chats associated with them?

02:08:48 17 A. Well, I wouldn't say it's correct to say I didn't look at
02:08:54 18 them, but I focused on episodes 1 through 50 because those
02:08:58 19 were the episodes that, again, you yourself, Mr. Armstrong,
02:09:04 20 claimed were the basis for being able to infer intent from
02:09:10 21 trading behavior.

02:09:12 22 Q. Okay.

02:09:12 23 But did you look at the episodes associated with the
02:09:19 24 defendants' chats as part of inferring intent for trading
02:09:23 25 behavior?

02:09:23 1 A. Well, again, I'm not inferring intent. That's --
02:09:27 2 that's -- I'm not a mind reader, and I'm not in a position to
02:09:31 3 do that.

02:09:32 4 But if you look at my exhibits, they contain not just
02:09:36 5 episodes 1 through 50, but also episodes 51 to 72. So, I
02:09:42 6 certainly did look at them and analyze them, and they were
02:09:46 7 part of the biased and misleading sample that I testified
02:09:49 8 about repeatedly. But I didn't form any opinion about chats.

02:09:54 9 Q. So, is it your testimony here today that the defendants'
02:09:58 10 own words about their own trades at the time didn't influence
02:10:04 11 your opinion in any way?

02:10:05 12 A. Correct, did not influence my opinion in any way one way
02:10:09 13 or the other.

02:10:10 14 Q. Now, sir, you certainly know that there are two kinds of
02:10:17 15 evidence, right?

02:10:20 16 A. You have to be a little bit more specific.

02:10:22 17 Q. Sure.

02:10:25 18 There's something called direct evidence, right?

02:10:27 19 A. Yes, I'm familiar with that term.

02:10:29 20 Q. And there's something called circumstantial evidence,
02:10:30 21 right?

02:10:30 22 A. I'm familiar with that term, as well.

02:10:33 23 Q. And direct evidence is statements actually made at the
02:10:39 24 time about the person who you're investigating, right?

02:10:43 25 MR. MENCHEL: Objection.

02:10:44 1 THE COURT: Sustained.

02:10:46 2 Perhaps if you could reformulate your question so

02:10:51 3 you're not talking about what evidence is, but perhaps what

02:10:56 4 factors the professor considers important.

02:11:01 5 MR. ARMSTRONG: Certainly, your Honor.

02:11:12 6 Court's indulgence.

02:11:14 7 (Brief pause.)

02:11:22 8 BY MR. ARMSTRONG:

02:11:22 9 Q. Now, sir, just to make sure we're on the same page, you

02:11:24 10 would agree that direct evidence could be found in written or

02:11:27 11 oral admissions, right?

02:11:28 12 MR. MENCHEL: Objection. I thought the Court had

02:11:30 13 given Mr. Armstrong some direction about how to handle this.

02:11:33 14 MR. ARMSTRONG: Your Honor, could I be heard on this?

02:11:34 15 THE COURT: You may.

02:11:41 16 (Proceedings had at sidebar:)

02:11:41 17 MR. ARMSTRONG: Your Honor, this witness in the 3 Red

02:11:44 18 case specifically criticized the government's witness for not

02:11:47 19 taking into account direct evidence. And he said that

02:11:51 20 because that --

02:11:53 21 MR. PAVLIS: Your Honor, I just took my headphones

02:11:56 22 off. He's speaking very loudly. The jury can hear everything

02:11:58 23 he's saying.

02:11:59 24 MR. ARMSTRONG: Your Honor, in the 3 Red case, this

02:12:01 25 witness, in a sworn affidavit, said that: Significantly,

02:12:05 1 Professor Bessembinder's opinion that Mr. Oystacher acted
02:12:11 2 without intent to execute trades is not based on any direct
3 evidence of intent, such as could be potentially found in a
4 trading algorithm or written or oral admissions.

5 THE COURT REPORTER: Please slow down.

02:12:22 6 MR. ARMSTRONG: Sorry.

02:12:22 7 So, your Honor, in the affidavit that this witness
02:12:25 8 presented to the Court, he said in paragraph 8 that:

02:12:29 9 Significantly, Professor Bessembinder's opinion that the
02:12:33 10 individual charged with spoofing acted without the intent to
02:12:36 11 execute trades is not based on any direct evidence of intent,
02:12:41 12 such as could be potentially found in a trading algorithm or
02:12:44 13 written or oral admissions.

02:12:46 14 And, so, he is directly doing what he criticized
02:12:49 15 someone else for doing.

02:12:53 16 THE COURT: Objection overruled.

02:12:54 17 To the extent you want to cross him with his prior
02:12:56 18 statements, you may do so.

02:12:57 19 (Proceedings had in open court:)

20 BY MR. ARMSTRONG:

02:13:03 21 Q. Now, Professor, before we left, we were talking about
02:13:06 22 direct evidence, right?

02:13:09 23 A. You were talking about direct evidence.

02:13:11 24 Q. Okay.

02:13:11 25 And you agree that direct evidence -- I want to make

02:13:14 1 sure I get this right.

02:13:15 2 Direct evidence could be potentially found in oral or
02:13:19 3 written admissions, right?

02:13:21 4 MR. MENCHEL: I still have the same objection, your
02:13:22 5 Honor.

02:13:22 6 THE COURT: Overruled.

7 BY THE WITNESS:

02:13:25 8 A. I mean, it sounds like it's calling for a legal opinion on
02:13:28 9 the definition of direct evidence. So, I'm not sure how to
02:13:31 10 answer. It sounds right. I guess I can say that much.

02:13:34 11 BY MR. ARMSTRONG:

02:13:34 12 Q. How about this: Did you say yourself that direct evidence
02:13:38 13 of intent could be potentially found in oral or written
02:13:42 14 admissions?

02:13:43 15 A. That's a different question. But, yes, I did -- well, I
02:13:46 16 probably said that. That sounds like something I could say.

02:13:49 17 Q. Okay.

02:13:50 18 And, in fact, in the 3 Red case that we just talked
02:13:52 19 about, you actually criticized the government's expert for not
02:13:55 20 looking at direct evidence, right?

02:13:58 21 A. I don't recall.

02:14:01 22 MR. ARMSTRONG: May I approach, your Honor?

02:14:03 23 THE COURT: You may.

24 BY MR. ARMSTRONG:

02:14:05 25 Q. Sir, I'm handing you what's been marked for demonstrative

02:14:08 1 purposes as Government Exhibit 244.

02:14:10 2 (Document tendered.)

3 BY MR. ARMSTRONG:

02:14:11 4 Q. Does that refresh your recollection about how you
02:14:12 5 criticized a government witness for not looking at direct
02:14:17 6 evidence in forming his opinion?

02:14:18 7 A. With your permission, can I read the paragraph that you're
02:14:21 8 referring to?

02:14:21 9 THE COURT: You may, Professor. Go ahead.

02:14:24 10 THE WITNESS: Thank you.

02:14:56 11 (Brief pause.)

12 BY THE WITNESS:

02:14:57 13 A. Okay. I've reviewed it.

14 BY MR. ARMSTRONG:

02:14:59 15 Q. So, I'm correct that you, in fact, criticized a government
02:15:01 16 expert for not examining at all direct evidence of intent,
02:15:04 17 right?

02:15:05 18 A. I don't think that's a fair characterization of the
02:15:07 19 paragraph.

02:15:08 20 MR. ARMSTRONG: Your Honor, permission to introduce
02:15:10 21 GX 252, Paragraph 8, as a prior inconsistent statement.

02:15:20 22 MR. MENCHEL: Can we have a sidebar on this?

02:15:26 23 (Proceedings had at sidebar:)

02:15:27 24 MR. MENCHEL: So, even though I was in this case, I
02:15:29 25 haven't looked at this affidavit in -- whatever year it was.

02:15:32 1 If we can have a moment to read it, I could decide if I should
02:15:36 2 lodge an objection, but I'm completely blind.

02:16:21 3 (Document tendered.)

02:16:21 4 (Brief pause.)

02:16:22 5 MR. MENCHEL: The professor is right. This is not a
02:16:26 6 criticism of something. He's merely saying here, is Professor
02:16:33 7 Bessembinder -- opinion is limited to the data. And what
02:16:36 8 Professor Fischel did was the same thing. They go to the
02:16:38 9 data, and they look at it.

02:16:40 10 Professor Fischel, based on my recollection anyway,
02:16:42 11 did not purport to testify in the 3 Red case about extrinsic
02:16:48 12 evidence or chats or anything like that. His testimony was
02:16:51 13 similarly limited to the confines of Professor Bessembinder's
02:16:55 14 testimony.

02:16:55 15 THE COURT: Mr. Armstrong, what prior statement that
02:17:01 16 Professor Fischel made here is inconsistent with that
02:17:08 17 statement?

02:17:08 18 MR. ARMSTRONG: "So, I'm correct that you, in fact,
02:17:11 19 criticized a government expert for not examining at all direct
02:17:14 20 evidence of intent?

02:17:15 21 "Answer: I don't think that's a fair
02:17:16 22 characterization of the paragraph."

02:17:18 23 And, so, it's inconsistent, your Honor.

02:17:23 24 THE COURT: In my mind, that is not an inconsistent
02:17:26 25 prior statement. It's not something that directly contradicts

02:17:32 1 his testimony here in court. And, so, therefore the objection
02:17:36 2 is sustained.

02:17:42 3 (Proceedings had in open court:)

4 BY MR. ARMSTRONG:

02:17:46 5 Q. Now, Professor, if you had direct evidence of intent,
02:17:49 6 certainly that would be important to look at, right?

02:17:54 7 A. Well, you know, for what purpose, I guess, is the
02:18:00 8 question.

02:18:02 9 Q. If you were tasked with trying to figure out the intent
02:18:05 10 behind a trade, direct evidence of the trader at the time
02:18:10 11 would be important to that question, right?

02:18:13 12 A. It certainly could be important to that question for the
02:18:16 13 Court or for the jury or potentially for me, depending on what
02:18:22 14 it was.

02:18:23 15 But in the case that you're referring to, as well as
02:18:26 16 in this case, my analysis was focused on the trading behavior
02:18:31 17 at issue, and I reached the conclusions that I did in that
02:18:35 18 case as well as in this case.

02:18:36 19 Q. Okay.

02:18:37 20 And, so, by reaching your conclusion in this case,
02:18:40 21 you ignored direct evidence, such as statements made in chats,
02:18:45 22 right?

02:18:46 23 A. Wouldn't say I ignored them. As I said, I became familiar
02:18:50 24 with them, and I analyzed the trading behavior itself in the
02:18:59 25 episodes where chats were alleged to have occurred. Those

02:19:04 1 were episodes 51 to 72, which were just as much a part of my
02:19:09 2 analysis as episodes 1 through 50.

02:19:13 3 So, it's not correct to say that I ignored them or
02:19:16 4 the economic evidence associated with them in terms of those
02:19:22 5 were the episodes where allegedly the chats occurred. I just
02:19:27 6 did not form an independent opinion about the meaning of the
02:19:32 7 chats as opposed to forming an independent opinion about how
02:19:37 8 the episodes, where -- which were alleged to be part of the
02:19:46 9 four-part -- the four-step alleged fraudulent scheme were
02:19:49 10 based on a biased and non-representative sample and provided
02:19:56 11 no support, in fact undermined the precise opening statement
02:20:01 12 that you gave, Mr. Armstrong.

02:20:03 13 Q. Okay.

02:20:04 14 Thank you for that, sir.

02:20:06 15 MR. ARMSTRONG: All right. Now, Mr. Fineman, GX 1,
02:20:08 16 episode 19, please.

02:20:15 17 BY MR. ARMSTRONG:

02:20:15 18 Q. Now, sir, maybe you recognize this as something that you
02:20:18 19 reviewed in this case, right?

02:20:20 20 A. You know, there's so many of these that look like this,
02:20:26 21 it's sort of hard to tell them apart. If it was one of the
02:20:29 22 government's exhibits or one of my exhibits, you know, then I
02:20:37 23 reviewed it, but --

02:20:38 24 Q. Does it refresh your memory, if you look at the top
02:20:41 25 right-hand corner, and see this is episode No. 19?

02:20:43 1 A. Yes, I see that. So, this would be one of the government
02:20:50 2 exhibits.

02:20:50 3 Q. Okay.

02:20:50 4 And this is one of the exhibits that you reviewed,
02:20:53 5 right?

02:20:53 6 A. Correct.

02:20:55 7 MR. ARMSTRONG: And, Mr. Fineman, if we can please
02:20:57 8 put next to episode 1 -- I'm sorry, GX 1, episode 19 and GX 1,
02:21:04 9 episode 47.

10 BY MR. ARMSTRONG:

02:21:13 11 Q. And, Professor, do you see that GX 1, episode 47, is also
02:21:18 12 one of the episodes you reviewed in this case?

02:21:20 13 A. Yes, I see that.

02:21:21 14 Q. And do you see on the right in episode 34, that's an
02:21:25 15 episode of Mr. Lakhan, right? Episode 19?

02:21:33 16 A. I'm -- you know, respectfully, I just don't understand
02:21:36 17 what you want me to look at.

02:21:37 18 Q. I'm just directing your attention to the episode on the
02:21:40 19 right, episode 19. That's an episode involving Mr. Lakhan,
02:21:45 20 right?

02:21:45 21 A. How do I know that? Oh, I see it. I see it at the top.

02:21:51 22 I'm sorry.

02:21:52 23 Q. That's okay.

02:21:52 24 All right. So, Mr. Lakhan's on the buy and sell
02:21:55 25 side, right?

02:22:01 1 A. Yes. I see that.

02:22:02 2 Q. Okay.

02:22:03 3 And on the left, we have Mr. Pacilio on the buy and
02:22:07 4 sell side, right?

02:22:08 5 A. Yes, sir, I see that, as well.

02:22:13 6 Q. And we see that in both instances, there is an iceberg
02:22:19 7 first to buy, right?

02:22:26 8 A. Again, if you want me to respond, can I just take a minute
02:22:30 9 to just look at these first?

02:22:31 10 Q. Of course.

02:22:32 11 A. Without your red, which is blocking the --

02:22:35 12 Q. Oh, I'm sorry.

02:22:38 13 A. -- the boxes.

02:22:40 14 Just give me a second, and I'll --

02:22:41 15 Q. Sure, take your time.

02:22:42 16 A. -- be ready.

17 Brief pause.)

18 BY THE WITNESS:

02:23:04 19 A. Okay. I'm ready.

02:23:06 20 BY MR. ARMSTRONG:

02:23:06 21 Q. All right.

02:23:06 22 So, now in both instances, we have first an iceberg
02:23:09 23 order to buy, right?

02:23:10 24 A. Correct.

02:23:10 25 Q. And on the opposite of the iceberg order to buy, we have

02:23:15 1 an approximate 100-lot order to sell, right?

02:23:19 2 A. Correct.

02:23:20 3 Q. Now, did you sit through testimony and hear how Mr. Lakhan

02:23:27 4 described how he learned to spoof?

02:23:32 5 A. I didn't sit through any testimony by Mr. Lakhan, as I've
02:23:37 6 tried to make clear.

02:23:41 7 I think I do remember, just from reading what he said
02:23:45 8 about how he learned how to spoof by learning from his
02:23:48 9 colleagues or something of that nature. At least that's what
02:23:52 10 I recall.

02:23:52 11 Q. And, so, you understand, as part of testifying today, that
02:23:57 12 Mr. Lakhan was taught by Mr. Pacilio how to spoof, right?

02:24:00 13 MR. MENCHEL: Objection to the form of the question.

02:24:02 14 THE COURT: Sustained.

02:24:04 15 Please rephrase.

16 BY MR. ARMSTRONG:

02:24:10 17 Q. And, so, you understand, as part of formulating your
02:24:13 18 opinion, that Mr. Lakhan was taught by Mr. Pacilio how to
02:24:18 19 spoof, right?

02:24:18 20 MR. MENCHEL: Same objection.

02:24:25 21 He's asking him to credit the witness.

02:24:28 22 MR. ARMSTRONG: That's not what I'm asking, your
02:24:30 23 Honor.

02:24:30 24 THE COURT: That's not what he's asking. He's asking
02:24:34 25 Professor Fischel what he considered.

1 BY THE WITNESS:

02:24:40 2 A. I have -- I don't have the testimony in front of me, but I
02:24:46 3 have a recollection that that is basically what Mr. Lakhan
02:24:49 4 testified to, although obviously I'd feel more comfortable if
02:24:52 5 I had the testimony in front of me.

6 BY MR. ARMSTRONG:

02:24:55 7 Q. Sure.

02:24:56 8 A. The transcript.

02:24:57 9 But as I said, your question is basically consistent
02:25:00 10 with my recollection of what Mr. Lakhan testified to.

02:25:04 11 Q. And, so, it was Mr. Lakhan who actually described the
02:25:08 12 four-part scheme as far as your understanding for testifying
02:25:11 13 here today, right?

02:25:13 14 A. He certainly -- he certainly described the four-part
02:25:16 15 scheme, correct.

02:25:17 16 Q. And you understood that he was actually the one who was
02:25:20 17 there at the time, right?

02:25:21 18 A. I understood that, as well.

02:25:22 19 Q. And, so, in the course of testifying about the misleading
02:25:43 20 picture that the government presented to the jury, you didn't
02:25:48 21 consider Mr. Lakhan's testimony about the four-part scheme?

02:25:52 22 A. I not only considered it, I tested it; and I had a number
02:25:58 23 of exhibits involving Mr. Lakhan, and they were just as biased
02:26:02 24 and non-representative as the other episodes in the government
02:26:11 25 episodes 1 through 72.

02:26:16 1 Q. So, it's your testimony that you're just not crediting Mr.
02:26:18 2 Lakhan's testimony?

02:26:20 3 MR. MENCHEL: Objection.

02:26:20 4 THE COURT: Sustained.

02:26:21 5 Please rephrase.

6 BY MR. ARMSTRONG:

02:26:23 7 Q. So, is it your testimony that you are just putting to the
02:26:27 8 side Mr. Lakhan's own words and his own testimony in analyzing
02:26:33 9 his trading patterns?

02:26:38 10 A. What I'm saying is I did an objective analysis of the
02:26:46 11 episodes that Mr. Lakhan was involved in, as I did with Mr.
02:26:54 12 Pacilio and Mr. Bases, and I concluded with respect to all of
02:26:59 13 those episodes, including the ones where Mr. Lakhan was
02:27:03 14 involved, that the episodes that Mr. Lakhan was involved in
02:27:11 15 government episodes 1 through 72 represented a biased and
02:27:16 16 non-representative sample of the relevant data, which I
02:27:21 17 described at length in my testimony.

02:27:24 18 Q. And, so, certainly you saw then that Mr. Lakhan described
02:27:27 19 how he spoofed frequently, right?

02:27:29 20 A. I think that's what he said.

02:27:32 21 Q. And certainly you understood that Mr. Lakhan described how
02:27:35 22 the defendants spoofed frequently, as well, right?

02:27:38 23 A. I think that's what he said.

02:27:41 24 Q. And, so, is it your opinion that in order for the
02:27:46 25 government to prove its case, we have to present to the jury

02:27:49 1 every single instance in which the defendants allegedly
02:27:53 2 spoofed?

02:27:53 3 MR. MENCHEL: Objection.

02:27:54 4 THE COURT: Sustained.

5 BY MR. ARMSTRONG:

02:28:04 6 Q. Is it your opinion, sir, that the only way the government
02:28:08 7 could not present a false and misleading narrative to the jury
02:28:11 8 is to present to the jury every single instance in which the
02:28:14 9 defendants allegedly spoofed?

02:28:23 10 A. My opinion is based on whether the episodes in government
02:28:33 11 episodes 1 to 72 were -- contained a fair and representative
02:28:42 12 sample of the trading behavior that Mr. Pacilio, Mr. Bases and
02:28:48 13 Mr. Lakhan were involved in.

02:28:51 14 And I concluded that the episodes that the government
02:28:56 15 presented and the trading data in those episodes represented a
02:29:01 16 biased and non-representative sample of the relevant trading
02:29:06 17 behavior in question. And that you, sir, Mr. Armstrong,
02:29:12 18 represented a false picture of what the evidence would show in
02:29:17 19 connection with those episodes in your opening statement to
02:29:21 20 the jury.

02:29:21 21 Q. Thank you, sir. I just want to make sure we're on the
02:29:24 22 same page.

02:29:25 23 So, is it your opinion that the only way that the
02:29:27 24 government can not be false and misleading is to just present
02:29:31 25 to the jury chart after chart after chart after chart of every

02:29:35 1 single instance in which the defendants were allegedly
02:29:38 2 spoofing?

02:29:40 3 A. That was not my opinion.

02:29:49 4 Q. And, sir, you're not a trial attorney, right?

02:29:51 5 A. I am not.

02:29:53 6 Q. Okay. Ever been to court in a non-testifying capacity?

02:29:56 7 A. You mean, in any -- like, watching or --

02:30:03 8 Q. Doing what I'm doing right now.

02:30:04 9 A. Doing what you're doing, no. No, never.

02:30:14 10 MR. ARMSTRONG: Your Honor, may I seek your guidance
02:30:15 11 on an issue?

02:30:21 12 (Proceedings had at sidebar:)

02:30:22 13 MR. ARMSTRONG: Your Honor, as a --

02:30:28 14 THE COURT: Mr. Menchel.

02:30:33 15 (Brief pause.)

02:30:33 16 MR. ARMSTRONG: Your Honor, as a segue into the data
02:30:36 17 and the charts that this witness has shown to the jury, I
02:30:39 18 intend to ask the witness whether another court has found that
02:30:43 19 his opinion should be barred because it was the product of
02:30:47 20 unreliable principles and methods reliably applied.

02:30:53 21 And, so, I think that's directly relevant to his
02:30:54 22 testimony and his allegation that it's the government that's
02:30:58 23 cherry-picking and presenting a misleading picture to the
02:31:00 24 jury.

02:31:00 25 THE COURT: And what case is that?

02:31:04 1 MR. ARMSTRONG: In re Pfizer, Inc. Securities
02:31:06 2 Litigation. I have a copy if your Honor wants it.

02:31:12 3 THE COURT: Mr. Menchel?

02:31:13 4 MR. MENCHEL: I'd like to see it.

02:31:19 5 THE COURT: Could I see a copy, as well?

02:31:23 6 Thank you.

02:31:58 7 (Document tendered to the Court.)

02:31:58 8 MR. MENCHEL: My understanding is this was reversed
02:32:00 9 on appeal by the appellate court. The case was sent back, and
02:32:05 10 actually Mr. -- Professor Fischel's client actually prevailed
02:32:10 11 in this case.

02:32:12 12 Do we really want to get into trials about other
02:32:14 13 cases where courts reversed?

02:32:17 14 THE COURT: Did the issue of Dr. Fischel being
02:32:23 15 excluded under Rule 702, did that come up on appeal?

02:32:29 16 MR. MENCHEL: Let me double-check. That's my
02:32:31 17 understanding, but let me double-check.

02:33:04 18 Judge, we're not -- my consultant is not a hundred
02:33:07 19 percent sure. Can we just take -- we're looking, pulling it
02:33:08 20 up on Westlaw as we speak.

02:33:24 21 MR. ARMSTRONG: Your Honor, I believe that the
02:33:26 22 subsequent order says, "As for Fischel's adjustment to the
02:33:30 23 price increases, the district court did not abuse its
02:33:33 24 discretion in concluding that this change was not sufficiently
02:33:36 25 reliable to be presented to the jury. However, Fischel's

02:33:42 1 error did not render the remainder of his testimony
02:33:46 2 unreliable. The Court should have prevented him from
02:33:50 3 testifying about the adjustment but otherwise allowed him to
02:33:52 4 present his findings on loss, causation and damages."

02:34:02 5 MR. MENCHEL: I mean, if they want to go into this,
02:34:04 6 we'll bring out all the things the Court said were perfectly
02:34:07 7 appropriate. I don't know what it gains them, but if that's
02:34:09 8 what they want to do, that's fine.

02:34:16 9 THE COURT: You can go ahead and do that.

02:34:29 10 (Proceedings had in open court:)

11 BY MR. ARMSTRONG:

02:34:29 12 Q. Now, Professor Fischel, you showed the jury --

02:34:32 13 MR. MENCHEL: I'm sorry, your Honor, one second,
02:34:33 14 please. I apologize. I'm trying to read this on the fly.

02:34:54 15 (Proceedings had at sidebar:)

02:34:54 16 MR. MENCHEL: Your Honor, in this case, the district
02:34:55 17 court -- the appellate court reversed, finding that the
02:35:01 18 district court abused its discretion by excluding all of
02:35:04 19 Fischel's testimony. In other words, this court was found to
02:35:09 20 have been wrong in preventing Professor Fischel from
02:35:11 21 testifying.

02:35:12 22 THE COURT: Well, as to a number of opinions, right,
02:35:15 23 but not all of them?

02:35:17 24 MR. ARMSTRONG: Correct.

02:35:18 25 THE COURT: So, if the government wants to get into

02:35:23 1 the fact that a court has at least found one of his
02:35:30 2 opinions -- you know, that there was an instance where a
02:35:33 3 district -- a court found an opinion that's being offered by
02:35:36 4 Professor Fischel as being unreliable, they're entitled to do
02:35:40 5 that.

02:35:41 6 MR. MENCHEL: Okay.

02:36:00 7 (Proceedings had in open court:)

02:36:00 8 MR. ARMSTRONG: Your Honor, may I have my copy back?

9 THE COURT: Oh, yes.

10 (Document tendered.)

02:36:06 11 MR. ARMSTRONG: Thank you.

12 BY MR. ARMSTRONG:

02:36:13 13 Q. Now, Professor Fischel, you were involved in the Pfizer
02:36:18 14 Securities Litigation case, right?

02:36:19 15 A. Yes, I was.

02:36:20 16 Q. And in that case, you tried to give an opinion at the
02:36:30 17 district court level, and the judge barred you from doing part
02:36:35 18 of that, didn't he or she?

02:36:38 19 A. Yes, that's correct, for -- that's -- at the district
02:36:41 20 court level, that's correct.

02:36:42 21 Q. And the court found that you failed to take into account
02:36:48 22 the impact of certain evidence, right?

02:36:56 23 A. You're talking about the district court level?

02:36:58 24 Q. Correct.

02:36:59 25 A. Again, I don't remember exactly what the court found, but

02:37:05 1 that's certainly consistent with my recollection.

02:37:06 2 Q. And, so, the court said you can't present your opinion at
02:37:11 3 trial because you just didn't take into account important
02:37:16 4 evidence, right?

02:37:19 5 A. You're not talking about the court of appeals, right? I
02:37:22 6 mean, where --

02:37:24 7 Q. The trial court, like this.

02:37:27 8 A. Yes, that's what the trial court found.

02:37:29 9 Q. And despite that ruling in the trial court, where we are
02:37:39 10 today, you still didn't sit through testimony, and you still
02:37:43 11 didn't review all the defendants' chats in this case, right?

02:37:46 12 MR. MENCHEL: Objection. Completely irrelevant to
02:37:48 13 this question.

02:37:50 14 THE COURT: Sustained.

02:37:53 15 It's also asked and answered. I think we all know
02:37:56 16 the answer to that question.

02:37:57 17 MR. ARMSTRONG: Thank you, Judge.

02:37:58 18 MR. MENCHEL: I should have said asked and answered.

19 BY MR. ARMSTRONG:

02:38:07 20 Q. Now, sir, a critical part of the four-part scheme that Mr.
02:38:12 21 Lakhan described was canceling the large orders quickly, and
02:38:16 22 you understood that, right?

02:38:18 23 A. That's the claim, yes, I understand that. The large
02:38:22 24 visible orders quickly.

02:38:23 25 Q. It's also the evidence from a witness who sat in that

02:38:28 1 chair, right?

02:38:30 2 MR. MENCHEL: Objection to what's evidence and what's
02:38:32 3 not evidence.

02:38:33 4 THE COURT: Sustained.

5 BY MR. ARMSTRONG:

02:38:35 6 Q. That's the testimony of Mr. Lakhan that you say you looked
02:38:38 7 at, right?

02:38:38 8 A. Correct.

02:38:39 9 Q. And, so, you understood, of course, the importance of
02:38:44 10 orders that are canceled quickly in a spoofing scheme, right?

02:38:55 11 A. I'm not sure how to answer that. Are you asking me to
02:38:57 12 assume that there was a spoofing scheme?

02:39:00 13 Q. You understood that the way the scheme was described was
02:39:04 14 that the cancellation of the spoof order was critical to the
02:39:08 15 operation of the scheme, right?

02:39:10 16 A. You mean do I understand that Mr. Lakhan said that? Or do
02:39:14 17 I understand that that's true? Or what exactly are you asking
02:39:17 18 me?

02:39:17 19 Q. I'm asking you, based on preparing for today, you
02:39:21 20 understood that, as part of all the evidence you reviewed,
02:39:27 21 that the cancellation of the spoof order was an important part
02:39:30 22 of the described scheme, right?

02:39:32 23 A. Described by Mr. Lakhan?

02:39:35 24 Q. Sure.

02:39:35 25 A. Because I don't think the orders were canceled quickly.

02:39:38 1 But if you want to know what he said based on my recollection,
02:39:42 2 which I think, again, is contrary to what the data show, I
02:39:46 3 think that is what he said.

02:39:50 4 Q. And you understood that part of the government's evidence
02:40:01 5 in this case was orders that were canceled in less than five
02:40:05 6 seconds, right?

02:40:10 7 A. Again, yes, I understand that, and that's what I tested.
02:40:14 8 That's part of the biased and non-representative sample of
02:40:18 9 data that the government presented.

02:40:20 10 Q. Got it.

02:40:21 11 So, you understood that part of the evidence -- proof
02:40:24 12 in this case was the cancellation of large orders in less than
02:40:27 13 five seconds, right?

02:40:29 14 A. I understand that's what the government claimed.

02:40:31 15 Q. Okay.

02:40:33 16 MR. ARMSTRONG: Government Exhibit 193, please,
02:40:36 17 Mr. Fineman -- sorry, Defendants' Exhibit 193.

02:40:39 18 Thank you.

02:40:40 19 And Page 6, please, Mr. Fineman.

20 BY MR. ARMSTRONG:

02:40:47 21 Q. So, sir, you see on the screen here -- and let me know
02:40:50 22 when you're ready.

02:40:50 23 A. Just give me a second, please.

02:40:52 24 Q. Of course.

02:40:52 25 A. Thank you.

02:41:05 1 (Brief pause.)

2 BY THE WITNESS:

02:41:06 3 A. Okay. I see that.

4 BY MR. ARMSTRONG:

02:41:07 5 Q. Now, sir, the large red order, the 200-lot order placed by

02:41:11 6 Mr. Pacilio, that was on the market for a minute and seven

02:41:17 7 seconds, right?

02:41:19 8 A. Yes, that's correct.

02:41:20 9 Q. Now, you know, based on all the evidence you reviewed,

02:41:25 10 that's not part of the government's spoof scheme?

02:41:29 11 A. That -- that's the point. I mean, the evidence is

02:41:32 12 inconsistent with the government's claims.

02:41:34 13 Q. That has nothing to do with it.

02:41:37 14 A. Excuse me, claims as presented in episodes 1 to 72.

02:41:40 15 Q. Sir, there's not a single piece of testimony or chat that

02:41:50 16 you've seen that describes how an order on the market for a

02:41:55 17 minute and seven seconds was part of a spoof scheme, was

02:41:58 18 there?

02:42:07 19 A. Again, that is just evidence of large visible orders

02:42:12 20 placed opposite icebergs in the total sample that reveals what

02:42:22 21 I'll call evidence -- economic evidence -- fundamentally

02:42:27 22 inconsistent with the government's claims of what the data

02:42:30 23 showed in episodes 1 through 72. It is one of the reasons why

02:42:36 24 the government's sample is so biased and non-representative,

02:42:42 25 because it does not describe what actually happened looking at

02:42:45 1 the full set of data.

02:42:47 2 Q. Now, sir, you testified about how markets can move at the
02:43:04 3 speed of light essentially, right?

02:43:06 4 A. Extremely quickly, that's right.

02:43:08 5 Q. And you would agree that putting a large order on the
02:43:14 6 market for a minute and seven seconds is just not really
02:43:18 7 evidence of a spoof scheme, right?

02:43:28 8 A. I don't know how to answer that other than what I've
02:43:30 9 already said.

02:43:32 10 This particular exhibit, now that you've showed it to
02:43:37 11 me, is another example of a large visible order. Using the
02:43:43 12 definition used by the government for what a large visible
02:43:47 13 order is, opposite an iceberg and rather operating like
02:43:57 14 clockwork as you represented to the jury, it was the exact
02:44:00 15 opposite, and that's what this exhibit shows.

02:44:02 16 Q. All right.

02:44:03 17 Now, sir, just two more questions on this exhibit.
02:44:05 18 You certainly understand as part of your testimony here today
02:44:08 19 that the government's four-part scheme involves a quick
02:44:11 20 cancellation, right?

02:44:16 21 A. My understanding is that the episodes in 1 to 72 that the
02:44:25 22 government relies upon all had quick cancellations, but I also
02:44:30 23 understand that that's one of the reasons that those episodes
02:44:36 24 represent a biased and non-representative sample of what the
02:44:40 25 data actually show.

02:44:42 1 Q. Okay.

02:44:43 2 And you certainly can understand the government is
02:44:46 3 not alleging that Mr. Pacilio never put on large orders in the
02:44:49 4 market, right?

02:44:51 5 A. As far as I know, there's no allegation to that effect.

02:44:55 6 Q. And, so, this document just proves that Mr. Pacilio put on
02:45:02 7 a large order and kept it on there for a while, right?

02:45:08 8 A. No. I think what it shows is that you can create charts
02:45:15 9 just like the government charts that show the exact opposite,
02:45:21 10 providing further evidence that the government relied on a
02:45:24 11 biased and non-representative sample of data.

02:45:30 12 Q. Biased and non-representative, kind of like not looking at
02:45:34 13 charts to figure out intent, right?

02:45:38 14 MR. MENCHEL: Objection to form of the question.

02:45:39 15 THE COURT: Sustained.

02:45:40 16 MR. ARMSTRONG: Withdrawn, your Honor.

02:45:41 17 Mr. Fineman, if you can please pull up DX 192,
02:45:44 18 please.

02:45:48 19 Page 2, please.

02:45:51 20 And, Mr. Fineman, if you can please pull up for the
02:45:53 21 jury and the professor Line 31, please.

02:46:03 22 And if you can please highlight Line 31, Mr. Fineman.

23 BY MR. ARMSTRONG:

02:46:09 24 Q. Sir, do you recognize that Line 31 is -- as part of DX
02:46:14 25 192 -- was one of the exhibits that you made to talk about

02:46:18 1 today?

02:46:19 2 A. Yes, I do recognize it.

02:46:20 3 Q. And that is one of Mr. Pacilio's episodes, right?

02:46:23 4 A. Yes.

02:46:27 5 Q. And this shows that Mr. Pacilio put in a 500-lot order to

02:46:34 6 buy that had a duration of .49 milliseconds, right?

02:46:44 7 A. .496 seconds, correct.

02:46:47 8 Q. That's pretty quick, right?

02:46:48 9 A. Very quick.

02:46:48 10 Q. That's a quick cancellation, right?

02:46:52 11 A. It is.

02:46:52 12 Q. And on the right of the screen, you described what happens

02:47:00 13 next, right, after that 500-lot buy order hit the market?

02:47:10 14 A. Well, the duration is the time between entry and

02:47:14 15 cancellation. So, to the right is what happened in that

02:47:20 16 intervening time.

02:47:22 17 Q. So, on the right, this shows what exactly happened in the

02:47:26 18 market for those .49 milliseconds, right?

02:47:29 19 A. That's right.

02:47:30 20 Q. And what happened was 31 contracts -- I'm sorry -- there

02:47:42 21 were 26 trades for 31 contracts, right?

02:47:45 22 A. That's right.

02:47:46 23 Q. Now, do you know how many of those contracts traded were

02:47:52 24 Mr. Pacilio's?

02:47:53 25 A. No, I don't.

02:47:54 1 Q. So, you see here that it says 31, right?

02:47:58 2 A. Yes, I see that.

02:47:59 3 Q. So, that's the number of contracts that were traded in

02:48:03 4 this .49-second duration, right?

02:48:05 5 A. Correct.

02:48:05 6 Q. And the date of this is January 4th, 2011, right?

02:48:11 7 A. That's right.

02:48:12 8 MR. ARMSTRONG: Mr. Fineman, could you please pull up

02:48:16 9 GX 1, episode 31.

10 BY MR. ARMSTRONG:

02:48:20 11 Q. And, sir, do you recognize that this is the exact same

02:48:21 12 episode for the line that we just looked at in DX 192, right?

02:48:34 13 A. Yeah, again, I'm not disagreeing, but I'm not --

02:48:37 14 Q. Take your time.

02:48:38 15 A. -- sure how you know that.

02:48:40 16 Q. Well, we can match it up. We went through before how Line

02:48:44 17 31 was the silver market for January 4th, 2011, in which Mr.

02:48:48 18 Pacilio put in a 500-lot buy order that had the duration of

02:48:54 19 .49 seconds --

02:48:55 20 A. Yes. You're quite right. I see it.

02:48:57 21 Q. Okay.

02:48:58 22 And how many of those 31 contracts, in the duration

02:49:01 23 of this .496 seconds, were orders of Mr. Pacilio?

02:49:27 24 A. I mean, it says the order was 92.1 percent of the visible

02:49:31 25 order book.

02:49:32 1 Q. No, I'm sorry. I'll circle it on the screen if it helps.

02:49:36 2 So, we saw before how, in the duration of .496

02:49:43 3 seconds, 31 contracts exchanged hands, right?

02:49:47 4 A. Correct.

02:49:47 5 Q. And this shows that of those 31, ten were iceberg orders

02:49:55 6 to sell of Mr. Pacilio, right?

02:50:00 7 A. Yes, that's what it shows.

02:50:01 8 Q. So, one-third of the contracts exchanging hands after Mr.

02:50:07 9 Pacilio places this 500-lot buy order were Mr. Pacilio's

02:50:13 10 orders to sell, right?

02:50:14 11 A. It looks like that. It looks like that.

02:50:27 12 Q. Now, sir, when you were talking before about what other

02:50:30 13 traders see and don't see, you would agree that 92 percent of

02:50:34 14 the visible order book is a large amount, right?

02:50:38 15 A. Yes, I would agree with that.

02:50:39 16 Q. For just one person?

02:50:43 17 A. Well, for -- any time something is 92.1 percent of the

02:50:48 18 visible order book, I would agree that's a high percentage.

02:50:51 19 Q. And, so, in this instance, Mr. Pacilio is changing his

02:51:01 20 mind, according to you, about buying or selling \$94 million in

02:51:09 21 silver?

02:51:09 22 MR. MENCHEL: Objection. There's been no testimony

02:51:11 23 about the mind of Mr. Pacilio by Professor Fischel.

02:51:14 24 MR. ARMSTRONG: I'll rephrase it, your Honor.

02:51:15 25 THE COURT: All right.

02:51:16 1 Go ahead and rephrase.

2 BY MR. ARMSTRONG:

02:51:30 3 Q. And, so, sir, we see that Mr. Pacilio put on, then took
02:51:35 4 off the market in a duration of less than half a second \$74
02:51:40 5 million, right?

02:51:41 6 A. The order to buy was for \$74 million, that's correct.

02:51:51 7 Q. And do you know whether this order was part of the
02:51:56 8 four-part scheme that Mr. Lakhan described as part of
02:51:59 9 testifying here today?

02:52:03 10 A. You mean according to Mr. Lakhan? Because I don't think
02:52:06 11 this demonstrates a four-part scheme even based on the
02:52:10 12 government's own exhibit.

02:52:13 13 But -- but if you're asking me do I remember that Mr.
02:52:18 14 Lakhan testified about this specific incident, no, I don't.

02:52:22 15 Q. Sir --

02:52:39 16 MR. ARMSTRONG: Mr. Fineman, if you can please pull
02:52:41 17 up DX 817.

18 BY MR. ARMSTRONG:

02:52:46 19 Q. Now, Professor, you recognize that this is one of the
02:52:49 20 documents that you testified about on direct examination with
02:52:54 21 Mr. Menchel, right?

02:52:55 22 A. Yes, I do remember that.

02:52:59 23 Q. And you show here that there were 4,117 visible orders
02:53:07 24 placed on the market around this time, right?

02:53:09 25 A. During this time, correct.

02:53:13 1 Q. Now --

02:53:19 2 A. The contracts traded, to be more precise.

02:53:21 3 Q. Now, where on this exhibit do you explain to the jury how

02:53:26 4 quickly those 4,117 visible orders were canceled?

02:53:35 5 A. I have that -- how quickly they were canceled? Well, I'm

02:53:45 6 a little bit confused by the question. This is contracts that

02:53:48 7 were traded as opposed to canceled.

02:53:53 8 Q. Now, sir, in GX -- I'm sorry, DX 815, you talked about the

02:54:15 9 21 percent of the visible orders that were hit, right?

02:54:24 10 A. Correct.

02:54:25 11 Q. Now, could you explain to the jury the actual number of

02:54:34 12 contracts that were bought or sold with those 21 percent?

02:54:45 13 A. I think the exhibit that you just showed, I believe, had

02:54:51 14 that data on it.

02:54:53 15 Q. And, sir, in the course of testifying here today, did you

02:54:56 16 review Government Exhibit 237?

02:55:00 17 A. I have to see it.

02:55:01 18 Q. Sure.

02:55:05 19 MR. MENCHEL: Is that in evidence?

02:55:06 20 MR. ARMSTRONG: No.

02:55:22 21 (Document tendered.)

02:55:22 22 (Brief pause.)

02:55:36 23 BY THE WITNESS:

02:55:36 24 A. I have seen this exhibit before.

02:55:36 25 BY MR. ARMSTRONG:

1 Q. Okay.

02:55:38 2 And, sir -- if I can have it back, please?

02:55:41 3 MR. MENCHEL: Your Honor, can we have a sidebar,

02:55:44 4 please?

02:55:44 5 THE COURT: All right.

02:55:54 6 (Proceedings had at sidebar:)

02:55:54 7 MR. MENCHEL: Your Honor, this was the exhibit that
02:55:57 8 the government made a strategic decision not to try to
02:56:03 9 introduce through the case agent. And this was their basis,
02:56:07 10 in part, for trying to prevent Dr. Fischel from -- Professor
02:56:13 11 Fischel from testifying.

02:56:14 12 I don't -- while he may have seen this exhibit, he
02:56:18 13 cannot lay a foundation or testify as to the accuracy of this
02:56:21 14 data at all. This was not created by him, and I don't -- I
02:56:25 15 object to him being questioned about a document for which no
02:56:28 16 foundation has been laid as to its accuracy. I was not
02:56:32 17 allowed to cross-examine on it because it was not introduced.

02:56:35 18 MR. ARMSTRONG: Your Honor, that foundation has been
02:56:37 19 laid. The professor reviewed it in the course of testifying
02:56:39 20 here today. We're not going to seek to move it in. We just
02:56:43 21 want to show that it presents a different picture from what is
02:56:46 22 depicted in DX 815 on Page 8.

02:56:50 23 MR. MENCHEL: My point is just because he looked at
02:56:52 24 it doesn't mean he can verify it's accurate, and they're
02:56:55 25 trying to backdoor in an exhibit that they chose not to

02:56:59 1 introduce before this jury.

02:57:03 2 THE COURT: I'm going to allow the government to
02:57:05 3 examine Dr. Fischel on this document, given the fact that he
02:57:08 4 reviewed it as part of formulating his opinions in the case.

02:57:13 5 MS. PORTER: Your Honor, we would object to questions
02:57:16 6 about the slides that relate to Mr. Bases. I don't know if
02:57:20 7 Mr. Armstrong was even planning to question about those.

02:57:22 8 MR. ARMSTRONG: I'm not.

02:57:23 9 MS. PORTER: Okay.

10 (Proceedings had in open court:)

11 BY MR. ARMSTRONG:

02:57:31 12 Q. So, Dr. Fischel, I think we have on the screen DX --

02:57:33 13 A. Professor, please.

14 Q. I'm sorry.

02:57:35 15 A. Mr. or Professor.

02:57:35 16 Q. Professor --

02:57:37 17 MR. MENCHEL: Your Honor, with respect, is this being
02:57:39 18 published? It's not in evidence before this case.

02:57:41 19 MR. ARMSTRONG: I'm not there yet.

02:57:41 20 THE COURT: 815?

02:57:45 21 MR. MENCHEL: No, it's not published yet. Never
02:57:48 22 mind.

23 BY MR. ARMSTRONG:

02:57:49 24 Q. Professor, we talked about how in DX 815 this shows that
02:57:54 25 21 percent of Mr. Pacilio's visible orders got hit, right?

02:57:58 1 A. Correct.

02:57:59 2 Q. But you don't say on here the actual number of contracts
02:58:05 3 that were traded in this 21 percent of visible orders, right?

02:58:11 4 A. Not on this exhibit, that's correct.

02:58:13 5 Q. Do you know the answer to that question?

02:58:15 6 A. Not from memory, no.

02:58:16 7 Q. Okay.

02:58:16 8 If I show you --

02:58:18 9 MR. ARMSTRONG: For the witness only, please.

10 BY MR. ARMSTRONG:

02:58:25 11 Q. -- GX 237, Page 8 --

02:58:29 12 MR. MENCHEL: Your Honor, I'd like to make the same
02:58:31 13 objection as before. It assumes the accuracy of what's being
02:58:34 14 shown.

02:58:35 15 THE COURT: Objection is overruled.

16 BY MR. ARMSTRONG:

02:58:38 17 Q. Now, Professor, do you know that of those 21 percent of
02:58:43 18 visible orders that only 418 of the roughly 150,000 contracts
02:58:49 19 were actually filled?

02:58:53 20 A. I don't know that. I don't know what the sample is of --
02:58:58 21 that's referred to on this particular document. It's not even
02:59:03 22 listed what sample this refers to. So, I have no idea whether
02:59:09 23 what you're saying is accurate or not accurate.

02:59:12 24 Q. Okay.

02:59:14 25 So, going back to 815, it is your testimony here

02:59:18 1 today that you have no idea, number one, the actual number of
02:59:24 2 contracts in these visible orders, and, number two, the number
02:59:29 3 of contracts that were actually filled; is that right?

02:59:33 4 A. I think I have another exhibit on the number of contracts
02:59:37 5 that were executed based on the sample that I reviewed. You
02:59:43 6 gave me something with no labeling, no sample, no
02:59:46 7 identification of what it is. So, I can't comment on it. But
02:59:50 8 I do know how many contracts were executed because I have a
02:59:53 9 separate exhibit on it.

02:59:55 10 Q. Okay.

02:59:55 11 Well, how many were there?

02:59:57 12 A. Hold on.

03:00:03 13 (Brief pause.)

14 BY THE WITNESS:

15 A. All right.

03:00:16 16 If you look at Exhibit 817 for the visible orders,
03:00:33 17 the answer is 4,117.

03:00:42 18 Q. 4,117.

03:00:45 19 What is the denominator? Of how many?

03:00:49 20 A. I don't know.

03:00:50 21 Q. That wasn't part of what you put together to talk about
03:01:04 22 before the jury today?

03:01:08 23 A. Not on this exhibit. There are other exhibits, I think,
03:01:12 24 that have fill rate percentages on them. But for purposes of
03:01:21 25 this exhibit, that data's not contained on this exhibit.

03:01:25 1 Q. And you would not, of course, want to give the jury a
03:01:28 2 false and misleading impression if the number was, in fact,
03:01:31 3 significantly higher than 4,000, right?
03:01:35 4 A. I don't understand the question. The 4,117 is the right
03:01:40 5 number. There's nothing misleading about it.
03:02:08 6 Q. Now, sir, DX 188 --
03:02:16 7 MR. ARMSTRONG: Mr. Fineman, if you can please blow
03:02:21 8 up the bottom half.
03:02:25 9 I'm sorry, Mr. Fineman, the top half.
10 BY MR. ARMSTRONG:
03:02:33 11 Q. And, sir, of Mr. Pacilio's non-iceberg orders, a hundred
03:02:40 12 lots or more, how many of those -- what's the fill rate of
03:02:46 13 those kinds of orders?
03:02:56 14 A. For those orders, .4 percent.
03:02:59 15 Q. And with an opposite side iceberg?
03:03:03 16 A. .2 percent.
03:03:05 17 Q. So, the fill rate of Mr. Pacilio's 100-lot orders opposite
03:03:12 18 an iceberg is .2 percent; is that right?
03:03:16 19 A. Correct.
03:03:32 20 MR. ARMSTRONG: Defense Exhibit 815 at 2, please.
21 BY MR. ARMSTRONG:
03:03:41 22 Q. Sir, you presented this document to the jury, correct?
03:03:43 23 A. I did.
03:03:44 24 Q. And the time period that you chose in this episode is
03:03:49 25 August 2008 through October 2014, right?

03:03:52 1 A. That's correct.

03:03:53 2 Q. And this is showing episodes where Mr. Pacilio and Mr.

03:04:00 3 Bases are essentially on the opposite side, right?

03:04:04 4 A. Correct.

03:04:04 5 Q. Now, you understand, from your review of the documents in

03:04:08 6 this case, that Mr. Pacilio and Mr. Bases only worked together

03:04:16 7 at the same bank for about a year, right?

03:04:19 8 A. I don't recall that specifically.

03:04:23 9 Q. That wasn't in the indictment that you reviewed in this

03:04:25 10 case?

03:04:26 11 A. It may have been. I just don't remember it.

03:04:30 12 MR. ARMSTRONG: Okay. GX 150, please.

13 BY MR. ARMSTRONG:

03:04:37 14 Q. Sir, does this refresh your memory -- and take your time

03:04:40 15 and read it -- that Mr. Pacilio and Mr. Bases were only at the

03:04:47 16 same bank for roughly a one-year period in 2010 and 2011?

03:05:07 17 A. A little hard for me to understand this, but it look -- I

03:05:11 18 mean, the overlap looks like it's approximately one year.

03:05:14 19 Q. Okay.

03:05:14 20 So, there's a one-year period of time where Mr.

03:05:17 21 Pacilio and Mr. Bases worked at the same bank, right?

03:05:21 22 A. Based on this exhibit, correct.

03:05:22 23 Q. And that was the period of time around 2010, 2011, right?

03:05:28 24 A. Correct.

03:05:29 25 Q. But instead of analyzing that one-year period, you looked

03:05:32 1 at the three years before they even worked at the same bank,
03:05:38 2 right?
03:05:39 3 A. I looked at the entire period that the indictment covered,
03:05:41 4 correct.
03:05:45 5 MR. ARMSTRONG: Go back to 815, please, DX.
6 BY MR. ARMSTRONG:
03:05:51 7 Q. So, on this chart here, which, again, involves Mr. Bases
03:05:55 8 and Mr. Pacilio on opposite sides of the market, for, what is
03:06:01 9 it, six of the seven years, they're not even at the same bank;
03:06:05 10 is that right?
03:06:06 11 A. Yes, that appears to be correct based on the exhibit that
03:06:09 12 you just showed me.
03:06:09 13 Q. And you recognize that the CME's an anonymous market,
03:06:14 14 right?
03:06:14 15 A. Yes.
03:06:14 16 Q. And, so, if they're not at the same bank working next to
03:06:20 17 each other, it's going to be pretty hard to figure out what
03:06:23 18 the other one's doing, wouldn't it?
03:06:24 19 A. Not necessarily.
03:06:34 20 Q. They could talk all the time, I guess, right?
03:06:39 21 A. Again, you're asking me to speculate on their
03:06:42 22 communications. But they could communicate in various ways
03:06:46 23 regardless of whether they were standing or sitting next to
03:06:49 24 each other.
03:06:49 25 Q. Okay.

03:06:52 1 And, so, for the alleged conspiracy part, the alleged
03:06:56 2 conspiracy, as part of the indictment that you reviewed in
03:06:57 3 this case, you did not narrow your time period to the time
03:07:00 4 period alleged for the conspiracy, right?

03:07:04 5 A. Not for purposes -- not for purposes of this exhibit.

03:07:10 6 MR. ARMSTRONG: DX 817, please, Mr. Fineman.

7 BY MR. ARMSTRONG:

8 Q. Sir, does this exhibit on the visible side order talk
9 about how long these contracts are actually on the market on
10 the visible side?

11 A. Not this exhibit. Other exhibits do that.

12 MR. ARMSTRONG: Your Honor, would now be a good time
13 for a short break?

14 THE COURT: That's fine.

15 Ladies and gentlemen, we'll take our afternoon break.
16 We'll reconvene in 15 minutes. Thank you for your attention.

17 During the break do not discuss the case with anyone,
18 including one another, and please do not do any independent
19 research regarding the case.

20 Thank you.

21 (Jury out.)

22 THE COURT: Professor Fischel, you may step down.
23 Thank you.

24 THE WITNESS: Thank you, your Honor.

25 THE COURT: Please be seated.

03:08:37 1 Mr. Armstrong, how much longer do you think you have?

03:08:46 2 MR. ARMSTRONG: Last folder, 10, 15 minutes.

03:08:48 3 THE COURT: Okay.

03:08:48 4 Mr. Menchel, perhaps you can educate me.

03:08:54 5 So, during the cross-examination, Mr. Armstrong

03:09:02 6 showed a -- I guess an episode that's not included in the

03:09:11 7 government's 70 or so episodes where the visible order was

03:09:17 8 maintained for more than a minute, right?

03:09:21 9 How is that -- how does that kind of work into

03:09:30 10 Professor Fischel's analysis? Like why is -- what is he

03:09:35 11 drawing from that?

03:09:37 12 MR. MENCHEL: The government is suggesting that the

03:09:40 13 only economically rational reason to place a large order

03:09:44 14 opposite an iceberg is to push the price into the direction of

03:09:48 15 the iceberg. And, therefore, because you don't want to get

03:09:52 16 hit, you cancel quickly. That's their case. Okay?

03:09:55 17 And what Professor Fischel is saying is there may be

03:09:58 18 many reasons to keep a large visible order on the market

03:10:01 19 opposite an iceberg, and just as often as it's canceled

03:10:04 20 quickly -- I shouldn't say just as often. I don't know the

03:10:06 21 numbers. Although it often is the case that it cancels

03:10:10 22 quickly, it also doesn't cancel quickly.

03:10:12 23 And the whole point, your Honor, is the government is

03:10:16 24 selecting the episodes where only that thing happened; that

03:10:21 25 is, the quick cancellation, and suggesting to the jury through

03:10:25 1 those episodes that if there's a quick cancellation, it means
03:10:28 2 he didn't intend to execute it.

03:10:30 3 I would also point out that in the same exhibit, we
03:10:33 4 have multiple examples, eight of them I'm going to put up --
03:10:36 5 probably won't go through eight -- where there is a very quick
03:10:39 6 cancellation followed by -- the placement of the large order,
03:10:42 7 cancel quickly, and where the spoof does not go in the
03:10:45 8 direction -- the pattern that they're alleging is a spoof --
03:10:48 9 does not go in that direction.

03:10:53 10 Can I also have a moment?

03:10:55 11 THE COURT: Yes.

03:10:56 12 (Brief pause.)

03:11:05 13 MR. PERRY: Your Honor, respectfully, this is exactly
03:11:07 14 the definitional issue I've been trying to flag for a bit of
03:11:11 15 time.

03:11:12 16 Our scheme is not that every time there's an iceberg
03:11:15 17 on one side and a visible order on the other side it is a
03:11:18 18 spoof. That is not our scheme. It's not what's alleged in
03:11:21 19 the indictment. It's not the pattern that we've put on. It's
03:11:26 20 not the scheme. And this is why I was opposed to this
03:11:28 21 testimony.

03:11:28 22 Our scheme is when there's an iceberg and visible
03:11:32 23 order that is -- on the opposite side that is canceled
03:11:34 24 quickly, regardless whether the iceberg's filled or not,
03:11:37 25 frankly, but where the visible order is canceled quickly, that

03:11:40 1 is the scheme. Nobody would allege -- we are not alleging --
03:11:43 2 that an order that stays in the market for one minute, two
03:11:47 3 minutes or, as in DX 193, Page 1, that remains in the market
03:11:50 4 for 50 seconds until it is fully filled is part of the
03:11:54 5 scheme --

03:11:54 6 THE COURT: And --

7 MR. PERRY: So --

03:12:02 8 THE COURT: It's like trying to take apart one thin
03:12:05 9 layer of an onion and splitting it up into two different
03:12:08 10 layers, right?

03:12:09 11 So, the government's theory of the case is that the
03:12:15 12 cancellation is part and parcel of what was originally
03:12:17 13 intended.

03:12:19 14 MR. PERRY: Exactly.

03:12:23 15 THE COURT: And not that the -- I was going to say
03:12:34 16 and not the fact that the reason that it's canceled is because
03:12:38 17 they didn't want to risk their large orders being on the
03:12:42 18 market, which is what Dr. Fischel -- Professor Fischel is
03:12:47 19 talking about, right?

03:12:49 20 MR. MENCHEL: I just want to make sure I understand
03:12:51 21 what you just said.

03:12:55 22 THE COURT: I guess I'm trying --

03:12:57 23 MR. PERRY: Correct, correct. That's exactly the
03:12:59 24 issue, right, is we've alleged in the indictment and described
03:13:02 25 a scheme that involves the rapid cancellation of an order.

03:13:05 1 And he's rebutting that evidence with evidence of orders that
03:13:08 2 remain on the market for an eternity or that are fully filled.

03:13:13 3 And --

03:13:13 4 THE COURT: I know, but the government's -- part of
03:13:16 5 the government's theory of the case, though, is that the
03:13:22 6 reason why a person that wants to do a spoof goes into the
03:13:28 7 spoof, knowing that they're going to cancel quickly, is
03:13:31 8 because that there's a risk they're going to get hit, right?

03:13:35 9 MR. PERRY: Yes.

03:13:35 10 THE COURT: Right?

03:13:36 11 MR. PERRY: Yes.

03:13:37 12 THE COURT: And, so, that's what's kind of -- that
03:13:44 13 risk is what is in the trader's mind when they first put in
03:13:49 14 the order, and that is what necessitates, as part of the
03:13:55 15 scheme, the trader's desire to cancel that order before it
03:13:57 16 executes, right? The definition of spoofing.

03:14:01 17 MR. PERRY: Yes.

03:14:01 18 THE COURT: And I think what Dr. Fischel is trying to
03:14:04 19 get at is that that assumption, that jump, that a trader will
03:14:15 20 always be afraid of getting a big order hit, right, is not
03:14:24 21 true.

03:14:24 22 MR. MENCHEL: Correct. It shows that there are other
03:14:26 23 reasons why a trader would place a large visible order
03:14:31 24 opposite an iceberg.

03:14:33 25 THE COURT: So, what Dr. Fischel is kind of attacking

03:14:39 1 in this particular arena is the government's assumption under
03:14:48 2 its four-step theory that you would never want -- going into a
03:14:55 3 spoof -- that no one want a large order hit, and so,
03:15:02 4 therefore, you assume when someone places a large order that
03:15:07 5 it's part of the spoof, and the fact that it's canceled is
03:15:14 6 just part of the scheme.

03:15:18 7 MR. MENCHEL: Correct.

03:15:20 8 MR. PERRY: Respectfully, your Honor, and I know that
03:15:23 9 it's nuanced and I appreciate that the Court's giving it full
03:15:27 10 consideration, it is simply reading out -- what he is doing is
03:15:32 11 he is attributing to us a two-step scheme, and that is simply
03:15:40 12 not it because the quick cancellation is a definitional
03:15:43 13 element of the scheme.

03:15:45 14 At every step of this litigation, that has been a
03:15:49 15 definitional step of the scheme; and, therefore, orders that
03:15:52 16 are left in the market for an eternity, like DX 193, Page 1,
03:15:55 17 are not part of the scheme.

03:15:56 18 THE COURT: I understand that.

03:15:57 19 But the government's saying that the reason why a
03:16:02 20 spoof, if I can use that term, cancels quickly is because
03:16:04 21 they don't want to get hit, right?

03:16:07 22 MR. PERRY: On their spoof orders.

03:16:08 23 THE COURT: Right, on their spoof orders.

03:16:10 24 MR. PERRY: Not on every large order.

03:16:11 25 THE COURT: No, I understand.

03:16:12 1 MR. PERRY: Okay.

03:16:13 2 THE COURT: Right? And, so -- and that's what I
03:16:19 3 think the government is going to argue to the jury is that we
03:16:22 4 know this is spoofing because, you know, we have -- aside from
03:16:28 5 whatever corroborating data -- corroborating evidence we have,
03:16:31 6 that they're going to do the four-step process, and they're
03:16:35 7 going to cancel the order quickly because they don't want
03:16:39 8 their big order hit.

03:16:44 9 And what Dr. Fischel is trying do is that he's kind
03:16:48 10 of peeling some of that back and saying, look, you know,
03:16:55 11 the -- it's not always the case that a cancellation is
03:16:59 12 indicative of a scheme to defraud because just because you
03:17:05 13 have a big order doesn't mean you're automatically going to
03:17:08 14 cancel because sometimes big orders stay on the market.

03:17:10 15 MR. MENCHEL: Correct. And I would also point out
03:17:12 16 that even five seconds, which is, I think, the government's
03:17:18 17 parameters are, as you -- I don't have to say it. You know.

03:17:24 18 THE COURT: Okay. Thank you. That was very --

03:17:28 19 MR. PERRY: Very helpful?

03:17:29 20 THE COURT: -- that was helpful.

21 (Laughter.)

22 THE COURT: So we'll take a five-minute break.

23 We'll do ten. Ten minutes.

03:17:45 24 (Brief recess.)

03:32:37 25 (Jury in.)

03:32:39 1 THE COURT: Professor Fischel?

03:32:40 2 THE WITNESS: Thank you, your Honor.

03:32:56 3 THE COURT: Mr. Armstrong?

03:33:00 4 MR. ARMSTRONG: Thank you, Judge.

5 BY MR. ARMSTRONG:

03:33:06 6 Q. Professor Fischel, almost done.

03:33:07 7 A. Okay.

03:33:09 8 THE COURT: Those are famous last words.

9 MR. ARMSTRONG: Yes.

03:33:12 10 (Laughter.)

11 BY MR. ARMSTRONG:

03:33:17 12 Q. Professor Fischel, do you mind if I come over to you and

03:33:19 13 draw on this butcher block paper?

03:33:21 14 A. Not at all.

03:33:22 15 Q. So, there's some elemental definitional points I just want

03:33:28 16 to go through with you very quickly, okay?

03:33:30 17 A. That's fine.

03:33:30 18 Q. Okay.

03:33:31 19 So, you understand the government's scheme is that

03:33:33 20 step one is the placement of an iceberg, right?

03:33:37 21 A. Correct.

03:33:37 22 Q. And step two is the placement of the large visible order,

03:33:42 23 right?

03:33:43 24 A. Correct.

03:33:43 25 Q. On the opposite side, of course, right?

03:33:48 1 A. Correct.

03:33:49 2 Q. And then step three is that the iceberg gets filled,

03:33:55 3 right?

03:33:55 4 A. Correct.

03:33:56 5 Q. And step four is the large order is canceled, right?

03:34:04 6 A. That's right.

03:34:04 7 Q. And it's canceled quickly, right?

03:34:06 8 A. Correct. That's the four-step scheme.

03:34:12 9 Q. That's the four-step scheme.

03:34:15 10 Now, in all your analysis that you did with

03:34:18 11 Mr. Menchel, your charts don't take into account the visible

03:34:22 12 orders that were canceled, right?

03:34:28 13 A. I wouldn't say that's right. I think we took into

03:34:31 14 account, and I took into account, all the relevant data,

03:34:39 15 execution rates, as well as cancellation rates.

03:34:41 16 Q. But the charts you presented to the jury do not have any

03:34:46 17 requirement that the visible orders are actually canceled

03:34:50 18 quickly, right?

03:34:53 19 A. They certainly don't have that as a requirement.

03:34:55 20 Q. Okay.

03:34:56 21 And, so, the charts you showed to the jury just

03:34:59 22 showed steps one and two; just an iceberg with just a large

03:35:07 23 order opposite it, right?

03:35:13 24 A. I wouldn't say that's the only thing we showed to the jury

03:35:16 25 or I showed to the jury. But it certainly includes steps one

03:35:23 1 and two.

03:35:23 2 Q. Right.

03:35:24 3 It included steps one and two to the exclusion of the

03:35:26 4 last step in the four-part scheme, right?

03:35:28 5 A. I would not say that's right.

03:35:30 6 Q. Now, sir, you certainly understand, as we just went over,

03:35:41 7 the government's four-part scheme, right? It involves a quick

03:35:46 8 cancellation, right?

03:35:46 9 A. That's part of the claim.

03:35:47 10 Q. Okay.

03:35:49 11 And the cancellation, as you know, can happen

03:35:51 12 anywhere between zero seconds and five seconds, right?

03:35:55 13 A. According to the government. But, again, that's one of

03:36:01 14 the things that was tested.

03:36:01 15 Q. According to the government and according to Mr. Lakan,

03:36:05 16 right?

03:36:05 17 A. That's right. According to them.

03:36:08 18 Q. Yes. Perfect. All right.

03:36:10 19 The cancellation in less than five seconds of the

03:36:15 20 large order, right?

03:36:18 21 A. That's the allegation. Again, that's what was analyzed

03:36:24 22 and demonstrated to be a biased and non-representative sample

03:36:30 23 of the relevant data.

03:36:31 24 Q. So, in DX 193, Page 1, this large order is on the market

03:36:43 25 for 35 seconds, right?

03:36:49 1 A. Yes, that's right.

03:36:49 2 Q. So, you just read out of the government's scheme the last
03:36:56 3 step that requires a quick cancellation, right?

03:36:59 4 A. Wrong. It's wrong because what the full data set reveals,
03:37:11 5 first of all, is that visible orders are not always canceled,
03:37:16 6 contrary to what you claim -- you personally in your opening
03:37:22 7 statement, as well as what the government claims that Exhibits
03:37:27 8 1 through 72 show. And not only do the visible orders not
03:37:37 9 always cancel, but they frequently get executed very, very
03:37:41 10 quickly, actually in less than five seconds, to use your
03:37:46 11 example.

03:37:46 12 Q. But, sir, we can agree, right, that an order that's a
03:37:49 13 large order that's left on the market doesn't have anything to
03:37:52 14 do with the four-part scheme in this case, right?

03:37:58 15 A. It has nothing to do with the claim of what -- whether the
03:38:06 16 evidence is consistent with a four-part scheme, but it has
03:38:09 17 everything to do with demonstrating that the trading data when
03:38:13 18 viewed in its entirety demonstrates that the government's
03:38:17 19 allegations about what the data show are based on a biased and
03:38:22 20 non-representative sample of the data.

03:38:26 21 Q. Okay.

03:38:26 22 You keep saying biased and non-representative sample.
03:38:30 23 And that's your accusation of the government, right?

03:38:32 24 A. It's certainly not an accusation. It's what I believe the
03:38:36 25 evidence shows.

03:38:38 1 Q. Okay.

03:38:38 2 Now, as part of removing bias, you, of course, want
03:38:46 3 to look at the full record before you, right?

03:38:48 4 A. I'm sorry, the -- what bias?

03:38:53 5 Q. As part of an academic, someone who studies bias, one way
03:38:58 6 to remove bias is to look at all the evidence you possibly
03:39:01 7 can, right, to inform your judgment, right?

03:39:03 8 A. All the evidence that's relevant to the opinions that
03:39:07 9 you're expressing, that's correct.

03:39:08 10 Q. And certainly in this case, as we went over before, the
03:39:13 11 relevant evidence would include the own words of the traders
03:39:18 12 whose trades you were analyzing, right?

03:39:21 13 MR. MENCHEL: Your Honor, this has been asked and
03:39:23 14 answered, I think, repeatedly.

03:39:24 15 THE COURT: Overruled.

03:39:24 16 The witness may answer.

17 BY THE WITNESS:

03:39:32 18 A. I would say the episodes -- episodes 51 through 72 where
03:39:39 19 those -- I guess what are referred to as chats, where they
03:39:44 20 occurred, that is certainly part of the analysis that I
03:39:49 21 performed and would have been incorrect if I had ignored those
03:39:58 22 episodes as a matter of proper methodology.

03:40:01 23 MR. ARMSTRONG: So, GX 21, episode 63-C, please.

24 BY MR. ARMSTRONG:

03:40:20 25 Q. Let me know when you're ready, sir.

03:40:23 1 A. I'm sorry?

03:40:24 2 Q. Let me know when you're ready?

03:40:25 3 A. Okay. One second.

03:40:27 4 Q. Sure.

03:40:28 5 (Brief pause.)

6 BY THE WITNESS:

03:40:51 7 A. Okay. I reviewed it.

8 BY MR. ARMSTRONG:

03:40:53 9 Q. Now, sir, is it your testimony that the large orders, the
03:41:02 10 200-lot orders in episode 63-C, have nothing to do with the
03:41:10 11 four-part spoofing scheme that's alleged in this case?

03:41:14 12 A. I think I've covered this multiple times. I think all of
03:41:20 13 the trading data, not just in episodes 1 -- government
03:41:25 14 episodes 1 through 72, but all the other data that the
03:41:29 15 government left out of its analysis, all of that data is
03:41:32 16 relevant to analyzing whether the data, when viewed in its
03:41:38 17 entirety, is consistent or inconsistent with the government's
03:41:42 18 alleged four-part scheme.

03:41:45 19 Q. Okay, sir. Just let me know if you agree with this
03:41:47 20 question or not, okay?

03:41:49 21 Is it your position here today that the episode in
03:41:53 22 63-C is not part of a four-part spoofing scheme?

03:42:04 23 A. My opinion would be that this episode by itself sheds no
03:42:10 24 light whatsoever on whether or not there was a spoofing
03:42:13 25 scheme.

03:42:14 1 Q. Okay.

03:42:14 2 Well, let's take a look at the direct evidence what
03:42:18 3 was being said at the time, okay?

03:42:20 4 A. Okay.

03:42:20 5 Q. So, we see here --

03:42:23 6 MR. ARMSTRONG: Mr. Fineman, if you can please blow
03:42:25 7 up the top box.

03:42:27 8 BY MR. ARMSTRONG:

03:42:27 9 Q. At 8:40:52, Mr. Pacilio says: "Guys, the algos are really
03:42:33 10 geared up in here. If you spoof this, it really moves."

03:42:40 11 Do you see that?

03:42:41 12 A. I do.

03:42:43 13 MR. ARMSTRONG: Mr. Fineman, please take that down.

14 BY MR. ARMSTRONG:

03:42:47 15 Q. And Mr. Fischel -- Professor Fischel, can you just tell
03:42:51 16 the jury what Mr. Pacilio does 42 seconds before saying: "If
03:42:56 17 you spoof this, it really moves"?

03:43:04 18 A. You want me to read what's in the red box? What are you
03:43:07 19 telling me to do?

03:43:08 20 Q. I want you to tell the jury what Mr. Pacilio does 42
03:43:12 21 seconds before saying: "If you spoof this, it really moves"?

03:43:22 22 A. It looks like he places a series of orders, and the best
03:43:39 23 bid and best ask, and the price move.

03:43:42 24 Q. Okay.

03:43:42 25 So, let's just do it together. So, the first thing

03:43:45 1 Mr. Pacilio does, 42 seconds before saying, "If you spoof
03:43:49 2 this, it really moves," is he puts in a 200-lot visible buy
03:43:55 3 order, right?

03:43:56 4 A. That's correct.

03:43:57 5 Q. All right.

03:43:57 6 And, then, about a minute after that, he puts in some
03:44:06 7 sell orders, right?

03:44:16 8 The green?

03:44:16 9 A. Yeah, no, I'm looking.

03:44:31 10 I'm trying to understand the legend. I'm sorry.

03:44:34 11 Q. That's okay. Take your time.

03:44:37 12 (Brief pause.)

13 BY MR. ARMSTRONG:

03:44:45 14 Q. Sir, isn't this the same exact legend from your charts?

03:44:49 15 A. I'm sorry, what's that?

03:44:50 16 Q. Isn't this the same exact legend from your charts?

03:44:52 17 A. Yes, but they're not colored, so --

03:44:55 18 Q. Got it.

03:44:56 19 A. But it looks like there's some executions on the iceberg
03:44:59 20 side.

03:44:59 21 Q. Okay.

03:45:00 22 So, approximately one minute after saying, "If you
03:45:07 23 spoof this, it really moves," Mr. Pacilio puts an iceberg
03:45:12 24 order to sell, right?

03:45:19 25 A. Yes.

03:45:19 1 Q. And then he puts in, as we can both agree, large orders to
03:45:24 2 buy, right?

03:45:25 3 A. Correct.

03:45:25 4 Q. And, so, as we see in the chart, step one is that Mr.

03:45:36 5 Pacilio puts in an iceberg to sell, right?

03:45:40 6 A. No. I mean, I don't agree that that by itself
03:45:44 7 demonstrates anything, let alone that it's proof of step one
03:45:49 8 of a four-step illegal spoofing scheme.

03:45:53 9 Q. Okay.

03:45:54 10 So, it's your testimony here today that one minute
03:45:59 11 before and after Mr. Pacilio says, "If you spoof this, it
03:46:05 12 really moves," that this episode is not part of a spoofing
03:46:11 13 scheme?

03:46:12 14 A. Again, I'm not commenting on the meaning of the words.
03:46:17 15 You'll have to find that from somebody else.

03:46:21 16 I'm saying this pattern of trading is completely
03:46:25 17 routine. It happens all the time. It's in no way indicative
03:46:30 18 of any wrongful conduct or spoofing scheme or anything else.

03:46:36 19 Q. Okay.

03:46:36 20 So, just to make sure we're on the same page, your
03:46:39 21 testimony is that this pattern is not indicative of spoofing,
03:46:44 22 even though Mr. Pacilio says he's spoofing?

03:46:50 23 A. Again, I'm not commenting on what Mr. Pacilio said or what
03:46:54 24 he meant. I'm commenting on what the relationship between the
03:47:01 25 visible orders and the iceberg -- what that demonstrates in

03:47:06 1 terms of whether it's supportive of a spoofing scheme or your
03:47:10 2 four-step spoofing illegal scheme. And the answer is it shows
03:47:15 3 nothing. Zero.

03:47:16 4 Q. Got it.

03:47:17 5 So, your testimony is that it's just impossible to
03:47:19 6 figure out what someone could be doing, even though we have
03:47:23 7 the trade data and their own words and we can all look at them
03:47:27 8 together?

03:47:30 9 A. I'm saying that I don't know what Mr. Pacilio meant. I
03:47:38 10 don't know what he meant by the terms that he was using. My
03:47:43 11 opinion is based on the trading data, as I've said numerous
03:47:48 12 times.

03:47:50 13 And this trading data that you've demonstrated in
03:47:54 14 this particular exhibit is completely routine. It happens all
03:47:59 15 the time, along with the opposite happening all the time.

03:48:04 16 So, therefore, it shows nothing, zero, in terms of
03:48:09 17 whether it provides any support for your four-part spoofing
03:48:13 18 illegal scheme.

03:48:14 19 Q. Okay.

03:48:15 20 Is it my illegal scheme? Am I the one who was
03:48:17 21 trading here?

03:48:18 22 A. You're not the one who was trading it, but you're the one
03:48:22 23 who is asserting it, who is alleging it, who's trying to prove
03:48:24 24 it and using this particular exhibit as evidence in support of
03:48:29 25 it. And I'm saying in the scheme of looking at all the

03:48:34 1 relevant data, it proves absolutely nothing.

03:48:38 2 Q. So --

03:48:39 3 A. Zero.

03:48:40 4 Q. -- is it your testimony that even though Mr. Pacilio says,
03:48:47 5 "If you spoof this, it really moves," that this kind of
03:48:52 6 trading conduct is just routine?

03:48:55 7 A. You know, I've gone through this several times. I'll say
03:48:58 8 it one more time. I have no opinion on what Mr. Pacilio meant
03:49:02 9 when he said what he said. My opinion is based on the
03:49:07 10 evidence from the trading pattern.

03:49:10 11 And what I'm saying is the trading pattern is
03:49:13 12 completely consistent with normal market activity that
03:49:18 13 provides no support for the four-step spoofing scheme that you
03:49:23 14 advanced in your opening argument.

03:49:25 15 Q. Okay.

03:49:25 16 So, last question on this, sir. I promise. Just to
03:49:28 17 make sure we're on the same page, it's your testimony here
03:49:32 18 today that Mr. Pacilio's statement, "If you spoof this, it
03:49:36 19 really moves," does not prove one way or the other what he's
03:49:40 20 doing?

03:49:42 21 A. Whether it proves to somebody other than me, that other
03:49:52 22 person can decide one way or the other.

03:49:53 23 Q. I'm asking if it proves it to you?

03:49:55 24 A. It doesn't prove anything to me.

03:49:56 25 Q. It means nothing?

03:49:57 1 A. It means nothing in the context of all of the relevant
03:50:00 2 trading data, including this trading data.

03:50:03 3 Q. And that's your opinion, right?

03:50:05 4 A. Yes, that is my opinion.

03:50:06 5 Q. And that is the opinion for which, in part, you've been
03:50:10 6 paid over \$4 million, right?

03:50:11 7 A. I only wish I personally was paid over \$4 million. That
03:50:16 8 is what the firm has billed for the time that we have spent on
03:50:23 9 the case.

03:50:23 10 Q. Money you haven't gotten yet, right?

03:50:27 11 A. From the letter that you showed me, it appears that the
03:50:29 12 firm has not been paid in full for the bills that we either
03:50:35 13 have sent or have represented that we will send.

03:50:39 14 Q. Okay.

03:50:41 15 MR. ARMSTRONG: And, Mr. Fineman, if you can please
03:50:43 16 pull up GX 42 at 17, please.

17 BY MR. ARMSTRONG:

03:50:56 18 Q. And, Professor, the jury's heard testimony about this
03:50:59 19 episode, but you have not, correct?

03:51:03 20 A. Correct.

03:51:03 21 Q. And, again, just very quickly walk it through with me. At
03:51:14 22 least the government's case, according to you, is that these
03:51:17 23 orders involve iceberg orders, large orders, icebergs that are
03:51:25 24 filled, and large orders that are canceled quickly, right?

03:51:31 25 A. Exactly what are you asking me?

03:51:34 1 Q. Do you agree that --

03:51:36 2 A. Do I agree that those are the four parts of the
03:51:39 3 government's four-part, four-step scheme?

03:51:41 4 Q. As shown in this episode?

03:51:43 5 A. It's really the same question all over again.

03:51:49 6 The fact that you can find examples where the four
03:51:53 7 things that are alleged, that there's an iceberg order, a
03:51:57 8 large order, the iceberg fills, and the visible order is
03:52:01 9 canceled quickly, there's no question you can find examples
03:52:04 10 that those occur.

03:52:05 11 But what you said in your opening argument is that
03:52:08 12 those are the only examples that ever occur. And that's
03:52:10 13 what's wrong. That's the biased and non-representative sample
03:52:14 14 that I've tried to explain that's inconsistent with just
03:52:23 15 looking at government episodes 1 to 72, which, as I've said
03:52:29 16 numerous times, present a biased and misleading, non-
03:52:33 17 representative sample of what the data show.

03:52:36 18 MR. ARMSTRONG: Mr. Fineman, can you please blow up
03:52:38 19 what I have generally highlighted, please.

03:52:41 20 Going down to -- perfect.

03:52:42 21 Can you cut it off about right here, please.

22 BY MR. ARMSTRONG:

03:52:50 23 Q. Now, Professor, what does Mr. Pacilio say around the time
03:52:58 24 that he puts in a large visible order opposite an iceberg that
03:53:06 25 he cancels?

03:53:10 1 A. What does he say? You mean you want me to read what's --

03:53:17 2 Q. Exactly.

03:53:17 3 A. -- in the red boxes?

03:53:18 4 Q. How about this one right here (indicating).

03:53:20 5 A. "That was me pushing it."

03:53:24 6 Q. And, of course, you can understand that in a spoofing

03:53:29 7 scheme, "pushing it" is pushing the price, right?

03:53:35 8 A. I assume so. I mean, that certainly sounds reasonable.

03:53:39 9 Q. And, so --

03:53:40 10 A. It could mean a lot of other things.

03:53:42 11 Q. What, pushing it like an ice cream truck?

03:53:45 12 A. No, not pushing an ice cream truck. Pushing a particular

03:53:49 13 strategy, pushing a particular set of planned trades. Pushing

03:53:57 14 it is not a very self-defining term.

03:54:00 15 Q. And --

03:54:06 16 MR. ARMSTRONG: Mr. Fineman, if you can just scooch

03:54:11 17 over the boxes, please.

18 BY MR. ARMSTRONG:

03:54:15 19 Q. After saying, "That was me pushing it," and then canceling

03:54:18 20 those large orders, Mr. Pacilio says, "Don't spoof it," right?

03:54:25 21 A. That's what's reflected in the box.

03:54:27 22 Q. And, again, to understand or to help understand what's

03:54:31 23 going on in this episode, it would be helpful, as part of

03:54:37 24 formulating your opinion, to hear from someone who

03:54:40 25 participated in this, right?

03:54:42 1 A. It might be helpful for certain purposes, but it's not
03:54:46 2 helpful for purposes of formulating my opinion because what I
03:54:50 3 analyzed are the episodes in which these statements or chats
03:54:56 4 occurred, and I reached the conclusions that I did.

03:55:00 5 Q. Okay.

03:55:00 6 So, just to be clear, is it your opinion here today
03:55:03 7 that all of these large visible orders opposite icebergs that
03:55:09 8 are canceled quickly around the time Mr. Pacilio says, "That
03:55:14 9 was me pushing it," have nothing to do with the four-part
03:55:18 10 scheme to spoof?

03:55:21 11 A. My opinion is as I've stated several times. It's not
03:55:24 12 based on the meaning of any of the chats. It's based on
03:55:29 13 analysis of the episodes in which the chats occurred. And
03:55:34 14 your description of the trading data is, again, a
03:55:43 15 misrepresentation of what the data show.

03:55:44 16 For every graph like this, there are graphs that show
03:55:47 17 the exact opposite. And that is why the data that you've
03:55:57 18 presented is a biased and non-representative sample of what
03:56:00 19 the trading data show.

03:56:02 20 Q. So, how many examples are there like this where Mr.
03:56:06 21 Pacilio is telling someone else don't spoof it, and he's
03:56:09 22 placing opposite side large orders that he cancels very
03:56:13 23 quickly at the same time?

03:56:15 24 MR. MENCHEL: Objection.

03:56:20 25 THE COURT: Sustained.

03:56:21 1 Can you rephrase?

03:56:23 2 MR. ARMSTRONG: Sure.

03:56:27 3 Mr. Fineman, if you can please go to GX 42 at 4.

4 BY MR. ARMSTRONG:

03:56:36 5 Q. Sir, maybe this one is a little bit more clear.

03:56:42 6 MR. ARMSTRONG: Mr. Fineman, if you can please pull

03:56:44 7 up this half of the screen, please.

8 BY MR. ARMSTRONG:

03:56:48 9 Q. Sir, do you see the large visible order placed by Mr.

03:56:53 10 Pacilio for 425 lots that he quickly cancels opposite his

03:56:59 11 icebergs to sell?

03:57:01 12 A. Yes, I see that.

03:57:02 13 Q. And do you see Mr. Pacilio say in his own words, "I just

03:57:06 14 put in 500 lots to spoof the gold"?

03:57:09 15 A. I see that.

03:57:10 16 Q. And have you looked at this chat before today?

03:57:13 17 A. Well, I looked at all the chats, and I looked at all the

03:57:19 18 government exhibits, so the answer is yes.

03:57:21 19 Q. And, so, just to be clear, it's your testimony here today

03:57:24 20 that even though Mr. Pacilio says, "I just put in 500 lots to

03:57:30 21 spoof the gold," that he wasn't actually spoofing the gold?

03:57:36 22 A. You know, again, I've said this numerous times. I'm not

03:57:41 23 forming my opinion based on the meaning of the chats. I have

03:57:45 24 no opinion on what the chats -- what they mean, the context in

03:57:51 25 which they were given.

03:57:52 1 But what I do have an opinion about is whether this
03:57:56 2 particular episode where the chat occurs demonstrates anything
03:58:01 3 about -- anything unusual or anything that would indicate that
03:58:07 4 there is something about this evidence, this trading evidence,
03:58:13 5 that's any more relevant than all of the other trading
03:58:16 6 evidence that Mr. Pacilio participated in which shows the
03:58:21 7 exact opposite.

03:58:23 8 And that's why this particular exhibit is no
03:58:26 9 different from all the other exhibits that the government has
03:58:32 10 presented that paint a very distorted and misleading picture
03:58:36 11 of the trading activity by Mr. Pacilio.

03:58:38 12 Q. So, it's your testimony to the jury that it's misleading
03:58:43 13 to say that Mr. Pacilio was spoofing the gold when he says he
03:58:49 14 was spoofing the gold?

03:58:53 15 A. Again, I've answered that many times. My opinion is not
03:58:58 16 based on what Mr. Pacilio said or what he meant. My opinion
03:59:05 17 is based on what he did.

03:59:07 18 And if you look at what he did in the episodes that
03:59:11 19 the government is basing its allegations on, episodes 1 to 72,
03:59:19 20 in the context of the full set of trading data, not focusing
03:59:25 21 on words, but focusing on actions, there is nothing to
03:59:30 22 indicate that there is anything unusual or different from
03:59:34 23 normal market activity that Mr. Pacilio engaged in looking at
03:59:40 24 the full range of trading data.

03:59:42 25 Q. So, in your professional expertise, words just don't

03:59:46 1 matter; is that right?

03:59:50 2 A. I certainly didn't say that. I said what my opinion is.

03:59:56 3 I can repeat it if it's helpful to you. But it's certainly

03:59:59 4 not what you just represented.

04:00:01 5 Q. So, is it fair to say that words do matter?

04:00:05 6 MR. MENCHEL: Objection.

04:00:06 7 THE COURT: Sustained.

8 BY MR. ARMSTRONG:

04:00:09 9 Q. So, Professor Fischel, in going through the data that you

04:00:14 10 presented to the jury today, you did not take into account the

04:00:18 11 defendant's own words, and you did not take into account the

04:00:21 12 testimony in this case, right?

04:00:22 13 A. The two things that you mentioned, the testimony and the

04:00:30 14 chats, were not the basis of my opinions, that's correct.

04:00:34 15 Q. Does it cost more money to give an opinion based upon

04:00:51 16 chats?

04:00:51 17 MR. MENCHEL: Objection.

04:00:52 18 THE COURT: Sustained.

04:00:55 19 MR. ARMSTRONG: No further questions, your Honor.

04:00:57 20 MR. MENCHEL: May I, your Honor?

04:01:00 21 May I?

04:01:00 22 THE COURT: You may.

04:01:01 23 Before you do, is there any examination from any

04:01:04 24 other parties?

04:01:05 25 MS. PORTER: No, your Honor. Thank you.

04:01:08 1 THE COURT: Go ahead, Mr. Menchel. Redirect.

04:01:11 2 MR. MENCHEL: Yes.

04:01:14 3 Can actually we just leave this exhibit up for one

04:01:17 4 second? Would the government mind?

5 REDIRECT EXAMINATION

6 BY MR. MENCHEL:

04:01:20 7 Q. Professor, in this exhibit, which I believe is GX 42 at 4,
04:01:25 8 approximately -- am I right, sir, that the visible order, the
04:01:35 9 425 lots, is over \$4 away from where the icebergs are on the
04:01:40 10 other side?

04:01:40 11 A. Yes, that's correct.

04:01:42 12 Q. And the government has said that a spoof are those four
04:01:46 13 steps that we're seeing on that whiteboard, white paper board
04:01:50 14 to your left. You see what I'm talking about?

04:01:51 15 A. Yes.

04:01:52 16 Q. Okay.

04:01:52 17 Was this a successful spoof?

04:01:56 18 A. I can't imagine that it would be, given the fact that
04:02:01 19 the --

04:02:02 20 MR. MENCHEL: Let me withdraw that question.

21 BY MR. MENCHEL:

04:02:05 22 Q. Where Mr. Pacilio said, "I just put in 500 lots to spoof
04:02:08 23 the gold," did these icebergs execute?

04:02:10 24 A. You know, could I see the -- I only have part of the --

04:02:14 25 Q. Yeah, but I'm asking you --

1 A. -- exhibit on the screen.

04:02:16 2 Q. -- at this moment -- this is the only thing I'm asking
04:02:18 3 you.

4 A. Oh, I --

04:02:18 5 Q. When this -- when this visible 42- --

04:02:20 6 A. No. No, they didn't.

04:02:21 7 Q. Okay.

04:02:23 8 So, by the definition of the government's definition
04:02:25 9 of spoofing, when Mr. Pacilio said, "I just put in 500 lots to
04:02:28 10 spoof the gold," did those four steps happen?

04:02:31 11 A. No.

04:02:32 12 Q. Okay.

04:02:33 13 Is there something in trading behavior called price
04:02:37 14 discovery, putting in orders to ascertain what liquidity may
04:02:42 15 or may not be in the market?

04:02:43 16 A. Yes.

04:02:44 17 Q. Is that a legitimate strategy?

04:02:45 18 A. Absolutely.

04:02:46 19 Q. Can you explain that, please?

04:02:47 20 A. Yes. A lot of times you don't know what the interest of
04:02:57 21 traders in the market are in trading and, if they are
04:03:02 22 interested, what price they are willing to trade at. So, one
04:03:07 23 of the things that you can do is to place an order yourself to
04:03:12 24 see what kind of reaction you get, both in terms of interest
04:03:17 25 and price.

04:03:20 1 MR. MENCHEL: Abbie, can you pull up GX 42 at Page

04:03:23 2 13, please.

04:03:25 3 BY MR. MENCHEL:

04:03:28 4 Q. This was one of the other episodes that Mr. Armstrong went

04:03:45 5 over with you.

04:03:47 6 MR. McGILL: I don't think we have control.

04:03:50 7 MR. MENCHEL: We need control apparently.

04:03:53 8 Thank you.

04:03:57 9 BY MR. MENCHEL:

04:04:01 10 Q. Now, I want to focus on what it was Mr. Armstrong asked

04:04:04 11 you about. He asked you about this (indicating) particular

04:04:07 12 statement by Mr. Pacilio saying, "Guys, the algos are really

04:04:10 13 geared up here. If you spoof it, it really moves. That's

04:04:13 14 where a lot of this noise is coming from."

04:04:16 15 Do you remember being asked questions about that?

04:04:19 16 A. Yes.

04:04:22 17 Q. And he said that this happened shortly after Mr. Pacilio

04:04:25 18 had placed his 200-lot visible order.

04:04:28 19 Do you see that?

04:04:31 20 A. Yes, I do.

04:04:34 21 Q. At the time that Mr. Pacilio placed that 200-lot order,

04:04:37 22 was there an iceberg on the other side?

04:04:40 23 A. No.

04:04:43 24 Q. Did the government's four-step process happen when Mr.

04:04:46 25 Pacilio said, "If you spoof it, it really moves"? Had

04:04:30 1 anything happened yet?

04:04:31 2 A. No.

04:04:31 3 Q. Were any icebergs executed when Mr. Pacilio said, "If you

04:04:36 4 spoof it, this really moves"?

04:04:38 5 A. No.

04:04:45 6 MR. MENCHEL: Thank you. You can take that down.

7 BY MR. MENCHEL:

04:04:48 8 Q. Professor, how many times have you testified as an expert
04:04:51 9 in various courts?

04:04:53 10 A. I think -- well, including arbitrations, approximately a
04:04:59 11 hundred.

04:04:59 12 Q. Okay.

04:05:00 13 And you were asked on cross-examination by
04:05:04 14 Mr. Armstrong if you recalled the Pfizer litigation. Do you
04:05:07 15 recall that? Pfizer Securities?

04:05:09 16 A. Yes, I do recall that.

04:05:11 17 Q. And Mr. Armstrong confined his questions to what happened
04:05:14 18 at the district court level with respect to whether you could
04:05:17 19 testify. Do you recall that?

04:05:18 20 A. Yes.

04:05:19 21 Q. And because you're a law professor, because you clerked on
04:05:23 22 the Supreme Court, I'm going to ask you some questions for the
04:05:26 23 benefit of the jury.

04:05:26 24 What court are we in now?

04:05:28 25 A. Federal district court.

04:05:30 1 Q. So, Judge Lee is a federal district court judge?

04:05:33 2 A. Correct.

04:05:34 3 Q. And as wise as he is, is there anybody that sits above him

04:05:39 4 as judges?

04:05:40 5 A. The United States Supreme Court and the federal court of

04:05:43 6 appeals.

04:05:44 7 Q. Well, let's just do it in order. What's directly above

04:05:46 8 the district court?

04:05:47 9 A. The federal court of appeals.

04:05:52 10 Q. All right.

04:05:52 11 And in the Pfizer litigation, did the court of

04:05:54 12 appeals reverse the decision of the trial court and allow you

04:05:57 13 to testify?

04:05:58 14 A. Yes. The court of appeals reversed the decision of the

04:06:03 15 district court, said that my testimony was appropriate to be

04:06:05 16 presented to the jury, and then the case then settled for a

04:06:10 17 very, very large amount.

04:06:11 18 Q. Well, let's forget about that.

04:06:13 19 By the way, there's been questions about your bill.

04:06:15 20 Is it your understanding that the money's being held back

04:06:19 21 until you say something that we want to hear?

04:06:21 22 A. That's not my understanding.

04:06:22 23 Q. Okay.

04:06:23 24 By the way, would that change your opinion, that

04:06:26 25 there's outstanding money still owed?

04:06:28 1 A. No.

04:06:29 2 Q. Is it a normal process in the billing of any company that

04:06:33 3 there's a lag between when the bills are invoiced and when

04:06:36 4 they're paid?

04:06:37 5 A. Yes.

04:06:37 6 Q. Okay.

04:06:38 7 Do you have any understanding that there's any

04:06:39 8 conditions attached to how you're going to get paid based on

04:06:42 9 your testimony in this case?

04:06:44 10 A. There are no conditions.

04:06:45 11 Q. Based on the outcome that this jury may present?

04:06:49 12 A. That's irrelevant to whether or not our bill will be paid.

04:06:54 13 Q. By the way, are there times when you have been asked by

04:06:59 14 either -- anybody, the government, a private party -- to

04:07:02 15 render an opinion and you've turned down the engagement?

04:07:05 16 A. Many times.

04:07:06 17 Q. Why is that?

04:07:06 18 A. Because I have a long track record of both testimony and

04:07:13 19 publications. And, therefore, I have certain beliefs, certain

04:07:20 20 views, as well as what the general obligations are of an

04:07:25 21 expert. And there are times -- and it happens fairly

04:07:30 22 frequently, actually -- where there are -- we have clients or

04:07:36 23 potential clients who want to retain us or retain me to

04:07:40 24 express a particular conclusion about a particular set of

04:07:47 25 economic evidence. And if I can't support it, I'm not willing

04:07:53 1 to do it. And I'm also not very helpful to the client who
04:07:57 2 would want that opinion as part of their presentation if I'm
04:08:02 3 not willing to do it.

04:08:04 4 Q. Okay.

04:08:05 5 A. So, typically, we reach a mutual decision prompted by my
04:08:10 6 saying I can't support -- I can't help you. I cannot support
04:08:14 7 what you want someone to say.

04:08:16 8 Q. And by mutual decision, you mean you walk away from the
04:08:19 9 engagement?

04:08:20 10 A. Walk away from the engagement, again, typically with the
04:08:23 11 client's understanding.

04:08:25 12 MR. MENCHEL: Can we put on the screen, please, for
04:08:28 13 demonstrative purposes, your Honor, the Defendants' Exhibit
04:08:33 14 147.

15 BY MR. MENCHEL:

04:08:35 16 Q. Now, this was the journal, again, that you were asked
04:08:38 17 about by Mr. Armstrong on cross-examination. Do you recall
04:08:41 18 that?

04:08:41 19 A. I do.

04:08:41 20 Q. And Mr. Armstrong made the point that this was about a
04:08:45 21 French market?

04:08:46 22 A. Correct.

04:08:46 23 Q. Okay.

04:08:47 24 I want to just blow up the abstract portion first.

04:08:51 25 MR. MENCHEL: If you would, Abbie, please, where it

04:08:53 1 says "many stock exchanges."

2 BY MR. MENCHEL:

04:08:56 3 Q. Did you understand that this article, which was published
04:08:58 4 in a peer-reviewed journal, was only supposed to be narrowed
04:09:01 5 to the data set they happened to be looking at to draw their
04:09:05 6 conclusions?

04:09:05 7 A. No. The opposite.

04:09:07 8 Q. In fact, can you read the first sentence of the abstract,
04:09:10 9 please?

04:09:11 10 A. "Many stock exchanges choose to reduce market transparency
04:09:16 11 by allowing traders to hide some or all of their order size."

04:09:21 12 Q. Okay.

04:09:21 13 So, this article was -- the data set chosen here was
04:09:26 14 to address what many exchanges do, correct?

04:09:29 15 A. Yes. I think that's what I said in my testimony.

04:09:32 16 Q. Okay.

04:09:33 17 MR. MENCHEL: And if we can go to the introduction,
04:09:35 18 please, of this first page.

04:09:37 19 THE WITNESS: I'm sorry? Say it again?

04:09:40 20 MR. MENCHEL: I'm directing Abbie to do something.

04:09:42 21 THE WITNESS: Oh, I'm sorry.

04:09:45 22 MR. MENCHEL: Can you take this off, please, Abbie
04:09:46 23 and go to the introduction.

24 BY MR. MENCHEL:

04:09:53 25 Q. Can you read the first sentence, please?

04:09:56 1 A. "Electronic limit order markets, which automatically
04:10:00 2 execute traders' orders on the basis of specified priority
04:10:03 3 rules, account for a large and increasing percentage of global
04:10:07 4 financial and commodity trading."

04:10:10 5 Q. Okay.

04:10:10 6 So, is this article just about what happens in one
04:10:13 7 market with French people?

04:10:15 8 A. No. As I said, it's a -- it's meant to be a general
04:10:19 9 discussion of the different types of traders and how they
04:10:26 10 react to limit orders that have been placed.

04:10:35 11 MR. MENCHEL: Now, if we can go to Defendants'
04:10:37 12 Exhibit 188, please.

13 BY MR. MENCHEL:

04:10:41 14 Q. You recall Mr. Armstrong asked you questions about the
04:10:43 15 fill rate of large orders. Do you recall that?

04:10:45 16 A. I do.

04:10:46 17 Q. And he was suggesting about something being misleading.
04:10:51 18 Do you remember that?

04:10:51 19 A. I remember the questioning.

04:10:53 20 Q. Okay.

04:10:54 21 First of all, let's be clear. This is the data that
04:10:58 22 you produced which has been offered in evidence before this
04:11:00 23 jury; is that correct?

04:11:01 24 A. That's correct.

04:11:01 25 Q. All right.

04:11:02 1 MR. MENCHEL: So, I want to blow up, please, Abbie,
04:11:07 2 if you would, that line that has the 4 percent. If you could
04:11:12 3 blow up that whole line across.

04:11:13 4 Yeah, that's good right there. Thank you.

5 BY MR. MENCHEL:

04:11:16 6 Q. Now, you see where it says the 4 percent over here?

7 A. Yes --

04:11:24 8 Q. Next --

04:11:24 9 A. -- I see that.

04:11:28 10 Q. Okay.

04:11:28 11 Am I right, Dr. Fischel, that that includes large
04:11:31 12 orders as defined by the government, whether they were with or
04:11:33 13 without icebergs?

04:11:34 14 A. Exactly. That's what it shows.

04:11:36 15 Q. Okay.

04:11:36 16 So, whether Mr. Pacilio had a large iceberg
04:11:40 17 opposite -- I'm sorry. Whether Mr. Pacilio had an iceberg
04:11:42 18 opposite a large order or not, what was the fill rate?

04:11:47 19 A. .4 percent.

04:11:48 20 Q. Okay.

04:11:48 21 And when he had it with an opposite side iceberg,
04:11:52 22 what was the fill rate?

04:11:53 23 A. .2 percent.

04:11:54 24 Q. Okay. And if I -- and I'm not going to say that I did the
04:11:58 25 math, but if I was to subtract 3,934 from 758 --

04:12:05 1 MR. MENCHEL: Abbie, can you blow this up, please.

04:12:08 2 BY MR. MENCHEL:

04:12:09 3 Q. -- am I right that that would give us the amount of times

04:12:11 4 of orders that Mr. Pacilio placed where there were no icebergs

04:12:15 5 but there was a large order?

04:12:17 6 A. Yes, exactly.

04:12:18 7 Q. And would that number be 3,176?

04:12:23 8 A. You're taxing my ability to do arithmetic on the fly. But

04:12:27 9 that looks about right. It sounds like you've done the

04:12:31 10 arithmetic already.

04:12:32 11 Q. Well, actually, I didn't, but somebody did. I can barely

04:12:36 12 add two numbers.

04:12:36 13 But in any event, so, just so the jury understands,

04:12:39 14 the number of times that Mr. Pacilio places a large order, as

04:12:42 15 defined by the government, a hundred lots or more or in groups

04:12:45 16 and the like, is 3,176 with no icebergs?

04:12:53 17 A. That's right.

04:12:54 18 Q. And the fill ratio, whether it's with icebergs, including

04:12:59 19 everything, or with just icebergs, the difference is a .2

04:13:03 20 percent; is that right?

04:13:03 21 A. Correct.

04:13:04 22 Q. What does that tell you in terms of your economic

04:13:06 23 analysis?

04:13:07 24 A. That -- first of all, that there are reasons to place

04:13:18 25 large limit orders that have nothing to do with trying to fill

04:13:24 1 icebergs because virtually all the time or the overwhelming
04:13:28 2 majority of the time, the orders are placed when there are no
04:13:33 3 icebergs that are opposite.

04:13:37 4 And what it also shows is that these orders tend to
04:13:40 5 be large, and so that the -- the number of fills that actually
04:13:46 6 result which produce the really low ratio is low. But that is
04:13:54 7 equally true whether the orders are placed opposite icebergs
04:13:59 8 or, in the vast majority of cases, where the large orders are
04:14:03 9 placed without any icebergs on the opposite side.

04:14:09 10 Q. Okay.

04:14:09 11 Whether it's a second, two second, five seconds, 20
04:14:19 12 seconds, is that enough time for an algorithmic trader to
04:14:22 13 decide what it wants to do with a large visible order?

04:14:25 14 A. Yes, absolutely.

04:14:26 15 Q. Why is that?

04:14:27 16 A. Because algorithmic traders operate by computer programs
04:14:33 17 and, as a result, they can react almost instantly to any
04:14:39 18 observable event, including the placement of a limit order.

04:14:42 19 Q. I want to show you one of the government exhibits that
04:14:47 20 Mr. Armstrong showed you on cross-examination.

04:15:00 21 MR. MENCHEL: This is Government Exhibit 1, Page 55,
04:14:53 22 please.

04:15:00 23 Can you blow up, please, Abbie, the portion where it
04:15:02 24 says, "order to buy 500 contracts \$74,512,500."

25 BY MR. MENCHEL:

04:15:11 1 Q. Do you see that?

04:15:12 2 A. Yes, I do.

04:15:13 3 Q. Okay.

04:15:13 4 Now, you understand that the way markets work is
04:15:17 5 banks, traders, don't actually have to put up \$74 million,
04:15:20 6 right? There's something called leverage in these markets?

04:15:23 7 A. Yes.

04:15:23 8 Q. All right.

04:15:23 9 And without getting too detailed about it, the point
04:15:26 10 is that that value is not what anyone has to actually pay
04:15:30 11 unless there's actually a delivery, right?

04:15:32 12 A. Yes. This is what I assume is the notional value that
04:15:34 13 would be paid on delivery, which, again, virtually never
04:15:38 14 occurs.

04:15:38 15 Q. Okay.

04:15:40 16 MR. MENCHEL: Can we blow this back out, please,
04:15:43 17 Abbie. Just take that off for a second.

18 BY MR. MENCHEL:

04:15:45 19 Q. Now, the difference between where Mr. Pacilio -- I'm
04:15:58 20 sorry, I did that wrong. Well, no.

04:16:01 21 The difference between where he placed his large
04:16:03 22 visible order and where -- I'm sorry, the difference between
04:16:08 23 where he had his iceberg, which was at 29.810.

04:16:15 24 Do you see that on the left?

04:16:16 25 A. Yes, I see that.

04:16:18 1 Q. Okay.

04:16:18 2 To where he could have traded, if he simply wanted to
04:16:21 3 cross the spread, was where?

04:16:22 4 A. Well, at that point in time.

04:16:28 5 Q. Okay.

04:16:29 6 And am I right, sir, that the difference between
04:16:32 7 where he was and if he wanted to cross would have been \$500?

04:16:39 8 A. It looks like it, yes.

04:16:40 9 MR. MENCHEL: Okay. Thank you. You can take that
04:16:42 10 down.

11 BY MR. MENCHEL:

04:16:44 12 Q. Now, the government asked you a bunch of questions about
04:16:45 13 the examples that we pulled out where the visible order was
04:16:50 14 kept open for a long time.

04:16:53 15 Do you recall that?

04:16:54 16 A. I do.

04:16:54 17 Q. And that that doesn't fit the pattern in the government's
04:16:58 18 episodes.

04:17:02 19 Do you recall that?

04:17:03 20 A. I do.

04:17:04 21 Q. Why was it relevant to your analysis to show the jury
04:17:07 22 times when a large visible order was placed and not canceled
04:17:11 23 within five seconds?

04:17:14 24 A. Again, because that happened routinely, if you look at all
04:17:24 25 the data. And that's exactly the opposite of what the

04:17:26 1 government said always happened as a matter of clockwork.

04:17:30 2 Q. Now, I want to show you, again, Defendants' Exhibit 193.

04:17:41 3 And this is a compendium of some of the examples that you put

04:17:44 4 together, which shows the opposite of what's in government

04:17:50 5 exhibits episodes 1 to 72, right?

04:17:52 6 A. Correct.

04:17:52 7 Q. By the way, I just want to be clear on this before we go

04:17:55 8 further. Mr. Armstrong asked you a bunch of questions about

04:17:59 9 the fact that other episodes were introduced during this trial

04:18:01 10 where it didn't go according to the episodes 1 to 72.

04:18:04 11 Do you recall that?

04:18:05 12 A. Yes.

04:18:05 13 Q. Okay.

04:18:05 14 Was your analysis keyed in on the 72 episodes chosen
04:18:09 15 by the government?

04:18:11 16 A. I looked at those, but I also wanted to create exactly the
04:18:18 17 same graphs that looked exactly the same but demonstrate the
04:18:22 18 opposite result.

04:18:23 19 Q. Okay.

04:18:23 20 And I want to pull up a couple of examples where the
04:18:28 21 durations were relatively short.

04:18:30 22 If we can go to Page 3 of this exhibit, please. This
04:18:38 23 is the January 4th, 2010, episode, do you see that, that you
04:18:41 24 put together?

04:18:42 25 A. Yes, I see that.

04:18:43 1 Q. Okay.

04:18:43 2 What happened in this episode, sir?

04:18:45 3 A. Well, first there was an iceberg to buy, it looks like, if

04:18:54 4 I'm reading correctly, 18 contracts.

04:18:59 5 And, then, there was visible orders that were placed

04:19:03 6 opposite the iceberg to sell 325 contracts. Two of those

04:19:13 7 contracts executed in 0.184 seconds, and the remaining

04:19:24 8 contracts were canceled in 0.84 seconds after placement.

04:19:32 9 So, again, this is inconsistent with the four-part

04:19:36 10 scheme in multiple different ways.

04:19:38 11 Q. So, if one was to try to infer one's intention just from a

04:19:42 12 pattern, does this pattern show that a trader would place the

04:19:46 13 order with the expectation that the market's going to move

04:19:50 14 away from him and go to the iceberg?

04:19:52 15 A. No. I mean, the opposite.

04:19:56 16 MR. MENCHEL: Let's go to Page 7, please, which is

04:20:00 17 episode dated October 14th, 2010.

18 BY MR. MENCHEL:

04:20:07 19 Q. And, again, this is another episode you constructed based

04:20:09 20 on the government's criteria; is that correct?

04:20:11 21 A. That's right.

04:20:11 22 Q. All right.

04:20:12 23 And what are we seeing here, Professor?

04:20:14 24 A. It's quite similar. You have an iceberg that's placed to

04:20:17 25 buy 50 contracts, and then while the visible -- excuse me,

04:20:28 1 while the iceberg is in effect, while it's open, there's a
04:20:35 2 placement of a visible order to sell 325 contracts. Again,
04:20:43 3 one of those contracts executes in 0.614 seconds. And the
04:20:51 4 remaining contracts are -- the visible contracts are canceled
04:20:55 5 within 1. -- canceled in 1.672 seconds, and then the icebergs,
04:21:05 6 again, never execute.

04:21:06 7 So, you have visible orders executing very quickly,
04:21:11 8 visible orders canceling very quickly, the iceberg being open
04:21:14 9 for a long time and never being hit. So, the iceberg just
04:21:20 10 cancels.

04:21:20 11 Q. And is the cancellation well within the five-second
04:21:23 12 threshold that Mr. Armstrong had asked you about?

04:21:26 13 A. Yes.

04:21:27 14 MR. MENCHEL: Can we go, please, to Page 9, November
04:21:30 15 5th, 2010, please.

16 BY MR. MENCHEL:

04:21:34 17 Q. What happened here, Professor?

04:21:35 18 A. This is, again, another example that basically has the
04:21:43 19 same conclusion. There's a placement of an iceberg order to
04:21:48 20 buy 25 contracts.

04:21:54 21 While the iceberg is open, there's a placement of two
04:22:00 22 visible orders to sell 350 contracts. One of those contracts
04:22:07 23 had executions and with 52 -- one of those orders, excuse me,
04:22:16 24 had executions with 52 contracts being sold, and the duration
04:22:21 25 of these visible orders range from 0.97 seconds to 1.165

04:22:30 1 seconds. And, again, the iceberg never was executed. It was
04:22:40 2 canceled.

04:22:41 3 Q. Is this well within the government's threshold of five
04:22:44 4 seconds?

04:22:45 5 A. Yes, absolutely.

04:22:47 6 MR. MENCHEL: Page 10, please.

7 BY MR. MENCHEL:

04:22:54 8 Q. It's November 19th, 2010. It's another episode that you
04:22:59 9 constructed?

04:22:59 10 A. Yes.

04:23:00 11 Q. And just briefly on this one, please, tell us what
04:23:03 12 happened.

04:23:03 13 A. Same issue, again. There's an initial iceberg that is
04:23:08 14 placed to -- with an order to sell 25 contracts. While that
04:23:14 15 iceberg is open in the market, a visible order was placed on
04:23:21 16 the opposite side to buy 600 contracts.

04:23:27 17 One of those orders had executions involving 22
04:23:32 18 contracts. And the duration of the visible orders ranged from
04:23:40 19 0.48 seconds to 3.532 seconds. And, again, the iceberg never
04:23:50 20 executed.

04:23:51 21 So, again, you have situations where visible orders
04:23:59 22 executed, visible orders were canceled within a very short
04:24:03 23 period of time, and the iceberg never executed. Again,
04:24:09 24 completely the opposite in multiple ways from the government's
04:24:12 25 description of the relevant data.

04:24:14 1 Q. Okay.

04:24:14 2 And, lastly, I want to show you a couple of charts
04:24:16 3 that Mr. Armstrong asked you about that you had constructed.

04:24:20 4 MR. MENCHEL: Can we pull up Defendants' Exhibit 817,
04:24:23 5 please.

6 BY MR. MENCHEL:

04:24:24 7 Q. Do you recall being asked questions by Mr. Armstrong about
04:24:26 8 this chart?

04:24:27 9 A. Yes, I do.

04:24:28 10 Q. And, specifically, he reminded you that the conspiracy
04:24:33 11 period in which Mr. Pacilio and Mr. Bases were alleged to have
04:24:39 12 been conspiring with one another was between June 2010 and
04:24:42 13 June 2011.

04:24:43 14 Do you recall that?

04:24:43 15 A. I do.

04:24:44 16 Q. And this chart contains all the times that -- hold on one
04:24:51 17 second, please. I think I have the wrong one.

04:25:00 18 (Brief pause.)

19 BY MR. MENCHEL:

04:25:20 20 Q. Now, did you also do an analysis just confining
04:25:23 21 yourself -- I think you mentioned this on cross-examination --
04:25:26 22 to the period of the alleged conspiracy?

04:25:28 23 A. Yes. First of all, it's contained in this larger period,
04:25:31 24 but we also looked specifically at the conspiracy period.

04:25:34 25 Q. I want to pull up Defendants' Exhibit 821, please.

04:25:40 1 What does this show?

04:25:43 2 MR. MENCHEL: And I would offer this, your Honor,
04:25:45 3 before it's published to the jury.

04:25:46 4 THE COURT: Any objection?

04:25:47 5 MR. ARMSTRONG: Your Honor, could I be heard briefly
04:25:51 6 on this.

04:25:59 7 (Proceedings had at sidebar:)

04:26:03 8 MR. ARMSTRONG: Your Honor, at this time, I think we
04:26:04 9 would just object to as beyond the scope, moving in new charts
04:26:09 10 after a lengthy direct and not responsive to anything on
04:26:13 11 cross.

04:26:15 12 THE COURT: Objection is overruled.

04:26:23 13 (Proceedings had in open court:)

04:26:23 14 MR. MENCHEL: This is received, your Honor?

04:26:24 15 THE COURT: Yes. Defendants' Exhibit 821 is entered
04:26:29 16 in evidence.

04:26:32 17 (Defendants' Exhibit No. 821 received in evidence.)

04:26:32 18 MR. MENCHEL: Can you please publish.

04:26:33 19 Thank you, your Honor.

20 BY MR. MENCHEL:

04:26:35 21 Q. Now, what does this show, Professor?

04:26:36 22 A. This is an analysis of contracts traded in Pacilio/Bases
04:26:47 23 episodes during what I understood to be basically the
04:26:52 24 conspiracy period from June 2010 to June 2011.

04:26:58 25 Q. Okay.

04:27:02 1 MR. MENCHEL: And, Abbie, if you would please go back
04:27:04 2 to 817 to Page 2.

04:27:09 3 And do a side-by-side, please, with the one I just
04:27:14 4 had up.

04:27:15 5 Thank you.

6 BY MR. MENCHEL:

04:27:41 7 Q. So, on the left, what are we looking at?

04:27:46 8 A. I think you've got -- this is like a little bit of a
04:27:49 9 mismatch.

04:27:49 10 Q. There we go.

04:27:51 11 A. No -- yes, that's right.

04:27:54 12 Q. Okay.

04:27:54 13 On the left, what are we looking at?

04:27:57 14 A. We're looking at the Pacilio/Bases episodes for the entire
04:28:02 15 period from August 2008 through October 2014.

04:28:09 16 Q. And on the right?

04:28:11 17 A. We're looking at the same analysis, but for what my
04:28:16 18 understanding is of the alleged conspiracy period.

04:28:20 19 Q. Okay.

04:28:20 20 And what does it show when you just confine your
04:28:24 21 analysis to the alleged conspiracy period?

04:28:29 22 A. It shows that there were 5,938 contracts that were
04:28:36 23 executed on the visible order side, and 4,978 contracts that
04:28:44 24 were executed on the iceberg side. And, again, there's then a
04:28:51 25 comparison of those numbers with the numbers that the

04:28:54 1 government presented in episodes 1 through 72.

04:28:59 2 Q. So, if you just confine your analysis to the alleged
04:29:02 3 conspiracy, are Mr. Pacilio and Mr. Bases getting more
04:29:07 4 executions on the side that the government is alleging a spoof
04:29:11 5 than they are on the episodes that the government is alleging
04:29:13 6 is the real order?

04:29:15 7 A. No, the opposite. Under the supposed four-step scheme,
04:29:20 8 the red bar should be zero and instead it's 5,938 contracts.
04:29:30 9 And the green bar, the icebergs, should have all the executed
04:29:33 10 orders, as opposed to a number that's less than the executed
04:29:38 11 orders on the visible order side.

04:29:40 12 Q. Yeah, I think you misunderstood the question, but you
04:29:42 13 answered it. But I want the record to be clear.

04:29:44 14 So, in other words, during the period of time that
04:29:47 15 the government alleges there was a conspiracy, Mr. Bases and
04:29:51 16 Mr. Pacilio got more executions when they were on the alleged
04:29:56 17 spoof side than when they were on the iceberg side?

04:29:59 18 A. That's correct.

04:30:00 19 Q. Okay.

04:30:01 20 I want to look at one more of these, please.

04:30:04 21 MR. MENCHEL: Can you pull up Government Exhibit 815.

04:30:17 22 One second, please.

04:30:22 23 Page 2.

24 BY MR. MENCHEL:

04:30:24 25 Q. You were similarly shown this -- I think this document by

04:30:27 1 Mr. Armstrong, if I'm remembering correctly. Perhaps not.

04:30:30 2 But in any event, what does this show again?

04:30:32 3 A. This is an analysis of hit rates, namely, what percentage

04:30:42 4 of the time visible orders were hit resulting in executed

04:30:47 5 contracts in Pacilio/Bases visible iceberg episodes, meaning

04:30:57 6 where one was on the visible order side and the other was on

04:31:00 7 the iceberg side.

04:31:01 8 Q. All right.

04:31:02 9 Now, I want to show you, just for your eyes only for

04:31:05 10 a moment, Defense Exhibit 819.

04:31:17 11 Do you recognize this?

04:31:18 12 A. Yes, I do.

04:31:18 13 Q. What is it?

04:31:19 14 A. It's the exact same analysis, but during -- just limited

04:31:23 15 to my understanding of the conspiracy period.

04:31:26 16 MR. MENCHEL: I offer it.

04:31:27 17 THE COURT: Any objection?

04:31:28 18 MR. ARMSTRONG: No objection.

04:31:28 19 THE COURT: Defendants' Exhibit 819 is admitted in

20 evidence.

04:31:34 21 (Defendants' Exhibit No. 819 received in evidence.)

04:31:34 22 MR. MENCHEL: Ask it be published please.

04:31:36 23 Can we do it in a side-by-side, please, Abbie.

04:31:43 24 Thank you.

25 BY MR. MENCHEL:

04:31:52 1 Q. So, when you compare --

2 MR. MENCHEL: You switched them the last time, but
3 that's all right.

4 Page 2, please.

5 BY MR. MENCHEL:

04:32:09 6 Q. When you compare the full dataset from August 2008 to

04:32:14 7 October 2014 with just the alleged conspiracy period of June
04:32:17 8 2010 to June 2011, does your result materially change?

04:32:21 9 A. No.

04:32:21 10 Q. So, what does it show -- just focusing on Defense Exhibit
04:32:24 11 819 -- just looking at the alleged conspiracy period?

04:32:30 12 A. It shows that visible orders resulted in at least some
04:32:39 13 executions; 37.9 percent of the time for the visible orders
04:32:46 14 and 16.9 percent of the time for the iceberg orders.

04:32:51 15 Q. And, again, just to be clear, which side is the government
04:32:54 16 alleging is the spoof side that you don't want to get
04:32:57 17 executions on?

04:32:57 18 A. The red bar, the 37.9 percent number.

04:33:03 19 Q. Okay.

04:33:04 20 And when we go to the full data set from October 2008
04:33:08 21 to October 2014 using Defense Exhibit 815, does it change
04:33:14 22 materially?

04:33:14 23 A. No. It's virtually identical.

04:33:18 24 Q. What is the fact that the pattern seems to hold before and
04:33:22 25 after the conspiracy versus when you're just looking at the

04:33:26 1 conspiracy? What does that tell you as an economist?

04:33:29 2 A. It tells you that one of the things that you would want to

04:33:33 3 check, and which we did check, when there's allegations of

04:33:38 4 wrongful conduct during a particular period, the conspiracy

04:33:42 5 period, you want to see if the results look different when

04:33:46 6 there's no allegations of wrongdoing but the same type of

04:33:53 7 trading by the same people is involved. And if the results --

04:33:57 8 Q. Hold on one second.

04:33:58 9 MR. MENCHEL: You want to do a sidebar?

04:34:00 10 THE COURT: No. I want you to move on.

04:34:02 11 MR. MENCHEL: Okay.

04:34:03 12 THE COURT: The jury is to disregard that last

04:34:04 13 question and answer, please.

04:34:08 14 MR. MENCHEL: I was trying to get something else, but

04:34:10 15 I read you --

04:34:15 16 THE COURT: I understand.

04:34:16 17 MR. MENCHEL: One second, please.

04:34:23 18 (Brief pause.)

04:34:24 19 MR. MENCHEL: Always helps to look at the judge.

04:34:29 20 Actually, I have no further questions, your Honor.

04:34:31 21 Thank you.

04:34:31 22 THE COURT: Thank you.

04:34:33 23 Anything else, Mr. Armstrong?

04:34:39 24 MR. ARMSTRONG: No.

04:34:42 25 THE COURT: All right. Anything else for Mr. Bases?

04:34:44 1 MS. PORTER: No. Thank you, your Honor.

04:34:45 2 THE COURT: Professor Fischel, you may step down.

04:34:47 3 THE WITNESS: Thank you, your Honor.

04:34:48 4 THE COURT: Thank you.

04:34:55 5 (Witness excused.)

04:34:55 6 THE COURT: Does Mr. Pacilio have any other witnesses

04:34:58 7 that he would like to call?

04:34:59 8 MR. MENCHEL: Can we confer briefly, your Honor.

04:35:03 9 (Brief pause.)

04:35:18 10 MR. MENCHEL: Your Honor, Mr. Pacilio rests.

04:35:19 11 THE COURT: All right.

04:35:21 12 So, ladies and gentlemen of the jury, the evidence

04:35:26 13 now has come to a close. That does not mean, however, that

04:35:32 14 you can begin to talk about it amongst yourselves or anyone

04:35:35 15 else. Not yet. Not yet.

04:35:39 16 What will happen is Monday, we will have -- you will

04:35:44 17 hear closing arguments from the attorneys. Then I will give

04:35:49 18 you the final instructions. And at that point, you will be

04:35:55 19 permitted to adjourn to the jury room to begin your

04:35:58 20 deliberations. Okay?

04:36:01 21 During the weekend break, please do not discuss this

04:36:05 22 case with anyone, including one another, and please do not do

04:36:09 23 any independent research regarding any of the issues you've

04:36:11 24 heard discussed in this case.

04:36:12 25 The other thing I would like to ask you is whether or

APPENDIX E

Ciamac C. Moallemi

Graduate School of Business
Columbia University



E
W

Research Interests

Analysis, optimization, and control of stochastic systems; applications in financial engineering, market microstructure, quantitative and algorithmic trading, and blockchain technology.

Academic Appointments

2007–present	Columbia University, Graduate School of Business <i>Decision, Risk, & Operations Division.</i>	New York, NY
2020–present	<i>William von Mueffling Professor of Business.</i>	
2015–2020	<i>Associate Professor of Business (with tenure).</i>	
2013–2015	<i>Barbara and Meyer Feldberg Associate Professor of Business.</i>	
2011–2012	<i>Associate Professor.</i>	
2008–2011	<i>Assistant Professor.</i>	
2007	<i>Instructor.</i>	

Academic Degrees

2003–2007	Stanford University <i>Ph.D., Electrical Engineering, 2007</i> Advisor: Benjamin Van Roy Dissertation Title: <i>A Message-Passing Paradigm for Optimization</i>	Stanford, CA
1996–1997	University of Cambridge (King's College) <i>Master of Advanced Study in Mathematics, With Distinction, 1997</i> (Part III of the Mathematical Tripos)	Cambridge, UK
1991–1996	Massachusetts Institute of Technology <i>S.B., Mathematics, 1996</i> <i>S.B., Electrical Engineering & Computer Science, 1996</i>	Cambridge, MA

Professional Experience

2014–present	Bourbaki LLC <i>Managing Member.</i> Developed quantitative trading strategies.	New York, NY
1999–2003	NeoGenesis Pharmaceuticals, Inc <i>Director, Scientific Computing.</i> Founded the informatics group at NeoGenesis, a technology start-up in the area of small molecule drug discovery. Co-designed and developed the NeoGenesis Quantized Surface Complementarity Diversity (QSCD) model, a computational framework for post-genomic drug discovery. Managed a group of developers and scientists responsible for development and implementation of mathematical algorithms for chemical library design, experimental data analysis, and bioinformatics. Engineered a computational cluster consisting of 100+ nodes and associated infrastructure. Acquired by Schering-Plough Corp.	Cambridge, MA

1993–1999	Delta Global Trading, LP	Boston, MA
<i>Partner.</i> Managed a fixed-income relative value hedge fund with US\$200 million in assets under management. Developed mathematical and computational models for identifying and exploiting economic mispricings in sovereign debt markets. Used stochastic models to trade a relative value arbitrage portfolio consisting of fixed income securities and associated derivatives in G10 and emerging markets. Series 3 licensed. Responsible for all software development efforts. Supervised a group of 13 including quantitative traders, software developers, and support staff.		

Journal Papers ¹

- [1] G. Huberman, J. Leshno, and C. C. Moallemi. Monopoly without a monopolist: An economic analysis of the Bitcoin payment system. *Review of Economic Studies*, forthcoming, January 2021.
- [2] S. Min, C. Maglaras, and C. C. Moallemi. Cross-sectional variation of intraday liquidity, cross-impact, and their effect on portfolio execution. *Operations Research*, forthcoming, June 2021.

- [3] N. Bhat, V. F. Farias, C. C. Moallemi, and D. Sinha. Near optimal A-B testing. *Management Science*, 66(10):4477–4495, October 2020.

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- [5] C. C. Moallemi, M. Sağlam, and M. Sotiropoulos. Short-term trading skill: An analysis of investor heterogeneity and execution quality. *Journal of Financial Markets*, 42:1–28, January 2019.

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Honorable Mention, INFORMS George Nicholson Student Paper Competition, 2011

- [11] C. C. Moallemi and M. Sağlam. The cost of latency in high-frequency trading. *Operations Research*, 61(5):1070–1086, September–October, 2013.

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- [12] V. V. Desai, V. F. Farias, and C. C. Moallemi. Approximate dynamic programming via a smoothed linear program. *Operations Research*, 60(3):655–674, May–June, 2012.

1st Place, INFORMS Junior Faculty Paper Competition, 2011

- [13] V. V. Desai, V. F. Farias, and C. C. Moallemi. Pathwise optimization for optimal stopping problems. *Management Science*, 58(12):2292–2308, December 2012.

Best Simulation Publication Award, INFORMS Simulation Society, 2014

- [14] C. C. Moallemi, B. Park, and B. Van Roy. Strategic execution in the presence of an uninformed arbitrageur. *Journal of Financial Markets*, 15(4):361–391, January 2012.

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¹The standard convention in my area is that authorship is in alphabetical order.

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- [2] C. Maglaras, C. C. Moallemi, and M. Wang. A deep learning approach to estimating fill probabilities in a limit order book. Working paper. Initial version: March 2021.
- [3] S. Min, C. C. Moallemi, and D. J. Russo. Policy gradient optimization of Thompson sampling policies. Working paper. Initial version: June 2020.
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- [5] C. C. Moallemi and K. Yuan. A model for queue position valuation in a limit order book. Working paper. Initial version: December 2016. Revised: June 2017.
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- [7] C. Maglaras, C. C. Moallemi, and H. Zheng. Optimal execution in a limit order book and an associated microstructure market impact model. Working paper. Initial version: May 2015.
- [8] O. Besbes, J. M. Chaneton, and C. C. Moallemi. The exploration-exploitation tradeoff in the newsvendor problem. Working paper. Initial version: November 2014. Revised: June 2021.
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- [11] P. Collin-Dufresne, K. Daniel, C. C. Moallemi, and M. Sağlam. Strategic asset allocation with predictable returns and transaction costs. Working paper. Initial version: August 2013. Revised: June 2015.
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- [14] C. C. Moallemi, S. Kumar, and B. Van Roy. Approximate and data-driven dynamic programming for queueing networks. Working paper. Initial version: December 2006. Revised: January 2013.

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- [1] G. Huberman, J. Leshno, and C. C. Moallemi. An economist’s perspective on the Bitcoin payment system. In *American Economic Association Papers and Proceedings*, volume 109, pages 93–96, May 2019.

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- [4] M. Broadie, Y. Du, and C. C. Moallemi. Risk estimation via weighted regression. In *Proceedings of the 2011 Winter Simulation Conference*, pages 3854–3865, December 2011.
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- [10] V. F. Farias, C. C. Moallemi, and B. Prabhakar. Load balancing with migration penalties. In *Proceedings of the IEEE International Symposium on Information Theory*, pages 558–562, Adelaide, Australia, September 2005.
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Book Chapters

- [1] V. V. Desai, V. F. Farias, and C. C. Moallemi. Bounds for Markov decision processes. In F. L. Lewis and D. Liu, editors, *Reinforcement Learning and Approximate Dynamic Programming for Feedback Control*, pages 452–473. IEEE Press, December 2012.

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- [1] R. Dewey and C. C. Moallemi. The unsolved mystery of the Medallion Fund's success. *Bloomberg Businessweek*, November 2019.
- [2] G. Huberman, J. Leshno, and C. C. Moallemi. The economics of the Bitcoin payment system. *Vox EU*, December 2017.
- [3] C. C. Moallemi. *A Message-Passing Paradigm for Optimization*. PhD thesis, Stanford University, September 2007.

Honors and Awards

- Sponsored Research Gift, J.P. Morgan, 2019 (\$150,000)
- Dean's Award for Teaching Excellence in a Core Course, Columbia Business School, 2014
- Best Simulation Publication Award, INFORMS Simulation Society, 2014
- NSF Grant CMMI-1235023, 2012–2015 (\$229,782; co-PI: Garud Iyengar)
Title: *Optimization Based Methods for Systemic Risk Management*
- Meritorious Service Award, *Operations Research*, 2011, 2012
- 1st Place, INFORMS Junior Faculty Paper Competition, 2011
- Benchmark Stanford Graduate Fellowship, 2003–2006
- Marshall Scholarship, 1996–1997
- 5th Place, Westinghouse Science Talent Search, 1991

Professional Activities

- Member, INFORMS
- Member, Columbia Business School Program for Financial Studies
- Member, Columbia University Center for Financial Engineering
- Member, Columbia University Data Science Institute
- Member, Columbia University Center for Applied Probability
- Associate Editor, *Operations Research*, 2010–present
- Associate Editor, *Management Science*, 2012, 2015–present
- Guest Editor, Special Issue on FinTech, *Information Systems Research*, 2017–2018
- Associate Editor, *Operations Research Letters*, 2014–2015
- Council Member, INFORMS Applied Probability Society, 2011–2013
- Committee Member, INFORMS George Nicholson Student Paper Competition, 2013, 2014
- Technical Reviewer (Journals): *Management Science*, *Operations Research*, *Mathematics of Operations Research*, *Stochastic Systems*, *Quantitative Finance*, *SIAM Journal on Financial Mathematics*, *Mathematical Finance*, *Journal of Computational Finance*, *Journal of Financial Markets*, *Market Microstructure and Liquidity*, *Queueing Systems*, *European Journal of Operations Research*, *Computational Optimization and Applications*, *IIE Transactions*, *IEEE Trans. Information Theory*, *IEEE Trans. Signal Processing*, *IEEE Trans. Automatic Control*, *IEEE Trans. Wireless*, *Journal of Machine Learning Research*, *IEEE J. Selected Areas in Communications*, *Automatica*
- Technical Reviewer (Conferences): Winter Simulation Conference, IEEE ISIT, NIPS, IEEE Infocom, IEEE CDC, IJCAI, MSOM
- Technical Reviewer (Funding Agencies): National Science Foundation, Research Grants Council (Hong Kong)

Doctoral Students Supervised

- [1] Vijay V. Desai (Ph.D. 2011, Columbia IEOR)
Thesis title: *Approximate Dynamic Programming for Large Scale Systems*
First position: SAS Institute
- [2] Yiping Du (Ph.D. 2011, Columbia IEOR, co-supervisor: Mark Broadie)
Thesis title: *Efficient Methods for Estimating Risk Measures*
First position: Barclays Capital
- [3] Mehmet Sağlam (Ph.D. 2012, Columbia GSB)
Thesis title: *Dynamic Trading Strategies in the Presence of Market Frictions*
First position: Postdoctoral Associate, Bendheim Center for Finance, Princeton University
- [4] Chen Chen (Ph.D. 2014, Columbia IEOR, co-supervisor: Garud Iyengar)
Thesis title: *Theory of Systemic Risk*
First position: Assistant Professor, ShanghaiTech University
- [5] Juan Chaneton (Ph.D. 2015, Columbia GSB, co-supervisor: Omar Besbes)
Thesis Title: *Decision Making with Coupled Learning: Applications in Inventory Management and Auctions*
First Position: Celect
- [6] Hua Zheng (Ph.D. 2015, Columbia GSB, co-supervisor: Costis Maglaras)
Thesis Title: *Microstructure Analysis of Dynamic Markets: Limit Order Books and Dynamic Matching Markets*
First Position: J.P. Morgan
- [7] Nikhil Bhat (Ph.D. 2015, Columbia GSB)
Thesis Title: *Tractable Algorithms for Sequential Decision Making Problems*
First Position: Airbnb
- [8] Kai Yuan (Ph.D. 2017, Columbia GSB)
Thesis Title: *Essays on Liquidity Risk and Modern Market Microstructure*
First Position: Two Sigma Investments
- [9] Seungki Min (Ph.D. 2021, Columbia GSB, co-supervisor: Costis Maglaras)
Thesis Title: *Modern Dynamic Programming Approaches to Sequential Decision Making*
First Position: Assistant Professor, KAIST (Korea Advanced Institute of Science and Technology)

[10] Muye Wang (Ph.D. 2021, Columbia GSB, co-supervisor: Costis Maglaras)
 Thesis Title: *Essays on the Applications of Machine Learning in Financial Markets*
 First Position: Two Sigma Securities

Invited Presentations

2021/03 Lyft, Rideshare Labs
 2020/10 Columbia University, Graduate School of Business, Decision, Risk, & Operations Division
 2020/05 TGS Management Company
 2020/02 CFM-Imperial College Quantitative Finance Seminar
 2019/10 Dartmouth Tuck School of Business
 2019/09 SAMSI Blockchain Workshop
 2019/08 UBS/Santa Fe Institute Machine Learning, Complexity, and Market Behavior Symposium
 2019/06 SIAM Conference on Financial Mathematics & Engineering
 2019/04 Engineers Gate LP
 2019/01 Utah Winter Operations Management Conference
 2018/11 Moody's, Innovation Speaker's Series
 2018/08 Goldman Sachs, Equities Execution
 2018/07 SIAM Annual Meeting, Mini-symposium on Financial Technology
 2018/04 Simons Institute, Foundations of Data Science Workshop
 2018/03 Columbia University, Program for Financial Studies
 2018/02 Cornell Tech, Financial Engineering in Manhattan
 2017/12 University of Cincinnati Lindner College of Business
 2017/11 Columbia University, Applied Mathematics Department
 2017/11 Columbia University, Graduate School of Business, Finance & Economics Division
 2017/06 Clinton Group
 2017/03 Symposium on High Frequency Trading, Carnegie Mellon University and University of Pittsburgh, Keynote Talk
 2016/11 Stevens Institute, High Frequency Finance and Data Analytics Conference
 2016/04 Columbia University, Graduate School of Business, Decision, Risk, & Operations Division
 2016/01 Citadel LLC
 2015/10 Deutsche Bank Annual Quantitative Strategy Conference
 2015/10 Columbia-JAFEE Conference on Financial Mathematics and Statistics
 2015/09 Manhattan College School of Business
 2015/06 IMS-FIPS Workshop on Probability and Statistics in Finance
 2015/06 Market Innovation Workshop, Columbia University Center for Pricing and Revenue Management
 2015/05 Federal Reserve Bank of New York, Financial Institution Supervision Group
 2015/05 Kepos Capital
 2015/04 Cornell University, Financial Engineering in Manhattan / Global Association of Risk Professionals
 2015/03 USC Marshall School of Business
 2015/03 IPAM Workshop on Systemic Risk and Financial Networks
 2014/12 Institut Louis Bachelier Conference on Market Microstructure
 2014/11 SIAM Conference on Financial Mathematics, Plenary Talk
 2014/11 SIAM Conference on Financial Mathematics, Mini-symposium on Systemic Risk
 2014/09 Newton Institute Workshop on Monitoring Systemic Risk
 2014/07 Banff International Research Station, New Directions in Financial Mathematics Workshop
 2014/06 London Business School
 2014/06 University College London
 2014/05 SIAM Conference on Optimization, Mini-symposium on Advances in Stochastic Dynamic Programming
 2014/05 MIT, Operations Research Center
 2014/03 International Association of Financial Engineers, Thalesians Seminar Series
 2014/02 AQR Capital Management
 2013/10 Stevens Institute, Modeling High Frequency Data in Finance Conference
 2013/10 INFORMS Annual Conference, Tutorial Speaker

2013/05 University of Chicago, High-Frequency Trading Conference
 2013/04 Syracuse University, Whitman School of Management, Finance Group
 2013/04 Cornell University, School of Operations Research & Information Engineering
 2013/02 Stanford University, Management Science & Engineering Dept
 2012/12 Barclays Capital, Portfolio and Risk Research Group
 2012/11 New York University, Stern School of Business, Operations Management Department
 2012/10 Stanford University, Management Science & Engineering Dept, New Directions Lecture Series
 2012/07 Stevens Institute, Modeling High Frequency Data in Finance Conference
 2012/07 SIAM Conference on Financial Mathematics, Mini-symposium on Limit Order Books
 2012/05 IMS Workshop on Probability and Statistics in Finance
 2012/05 Two Sigma Investments LLC
 2012/03 Goldman Sachs, Equity Strategy Group
 2012/02 Pragma Trading Quantference
 2011/12 University of Utah, Eccles School of Business, Finance Group
 2011/10 Columbia University, High Frequency Trading and Market Microstructure Conference
 2011/09 JP Morgan, Quantitative Research Group
 2011/07 Stevens Institute, Modeling High Frequency Data in Finance Conference
 2011/03 Duke University, Fuqua School of Business, Decision Sciences Group
 2011/02 Carnegie Mellon University, Tepper School of Business, Operations Management Group
 2011/01 Tata Institute for Fundamental Research
 2010/12 National Bureau of Economic Research, Market Microstructure Group (discussant)
 2010/11 Rutgers University, Mathematical Finance and Probability Seminar
 2010/11 Stanford University, 2nd Stanford Conference in Quantitative Finance
 2010/11 University of Texas Austin, McCombs School of Business, Texas Quantitative Finance Festival
 2010/10 New York University, Stern School of Business, Operations Management Department
 2010/05 Knight Capital Group
 2010/04 New York University, Courant Institute of Mathematical Sciences
 2010/04 Columbia University, Statistics Department
 2010/03 Fields Institute, Workshop on Computational Methods in Finance
 2010/02 Cornell University, Financial Engineering in Manhattan
 2009/11 Columbia University, Center for Financial Engineering
 2009/11 SAC Capital Advisors
 2009/10 Northwestern University, Industrial Engineering & Management Sciences Department
 2009/06 US Commodity Futures Trading Commission
 2009/05 MIT, Sloan School of Management, Operations Management Department
 2009/04 FDIC, Center for Financial Research
 2009/03 University of Pennsylvania, Electrical & Systems Engineering Department
 2008/06 Cornell University, School of Operations Research & Information Engineering
 2008/05 ETH Zürich, Department of Information Technical & Electrical Engineering
 2008/04 Columbia University, Graduate School of Business, Finance & Economics Division
 2008/02 Columbia University, Statistics Department
 2007/03 UC Berkeley, Department of Electrical Engineering & Computer Science
 2007/03 Stanford University, Information Systems Laboratory
 2007/02 Northwestern University, Kellogg School of Management, MEDS Department
 2007/02 New York University, Stern School of Business, IOMS Department
 2007/01 Columbia University, Graduate School of Business, Decision, Risk, & Operations Division

Teaching Experience

	Columbia University, Graduate School of Business	New York, NY
2021 Spring	Lecturer, The Analytics Advantage (B8147-001, MBA Elective)	
2021 Spring	Lecturer, The Analytics Advantage (B8147-002, MBA Elective)	
2020 Fall	Lecturer, Business Analytics (B6101-005, MBA Core)	
2020 Fall	Lecturer, Business Analytics (B6101-006, MBA Core)	
2020 Fall	Lecturer, Business Analytics (B6101-007, MBA Core)	
2020 Fall	Lecturer, Business Analytics (B6101-008, MBA Core)	
2020 Spring	Lecturer, The Analytics Advantage (B8147-001, MBA Elective)	
2020 Spring	Lecturer, The Analytics Advantage (B8147-002, MBA Elective)	
2019 Fall	Lecturer, Business Analytics (B6101-005, MBA Core)	
2019 Fall	Lecturer, Business Analytics (B6101-006, MBA Core)	
2019 Fall	Lecturer, Business Analytics (B6101-007, MBA Core)	
2019 Fall	Lecturer, Business Analytics (B6101-008, MBA Core)	
2018 Fall	Lecturer, Business Analytics (B6101-005, MBA Core)	
2018 Fall	Lecturer, Business Analytics (B6101-006, MBA Core)	
2018 Fall	Lecturer, Business Analytics (B6101-007, MBA Core)	
2018 Fall	Lecturer, Business Analytics (B6101-008, MBA Core)	
2017 Fall	Lecturer, Business Analytics (B6101-002, MBA Core)	
2017 Fall	Lecturer, Business Analytics (B6101-004, MBA Core)	
2017 Fall	Lecturer, Business Analytics (B6101-005, MBA Core)	
2017 Fall	Lecturer, Business Analytics (B6101-008, MBA Core)	
2016 Fall	Lecturer, Business Analytics (B6101-004, MBA Core)	
2016 Fall	Lecturer, Business Analytics (B6101-005, MBA Core)	
2016 Fall	Lecturer, Business Analytics (B6101-007, MBA Core)	
2016 Fall	Lecturer, Business Analytics (B6101-008, MBA Core)	
2015 Fall	Lecturer, Business Analytics (B6101-005, MBA Core)	
2015 Fall	Lecturer, Business Analytics (B6101-006, MBA Core)	
2015 Fall	Lecturer, Business Analytics (B6101-007, MBA Core)	
2015 Fall	Lecturer, Business Analytics (B6101-008, MBA Core)	
2014 Fall	Lecturer, Business Analytics (B6101-001, MBA Core)	
2014 Fall	Lecturer, Business Analytics (B6101-002, MBA Core)	
2014 Fall	Lecturer, Business Analytics (B6101-005, MBA Core)	
2014 Fall	Lecturer, Business Analytics (B6101-007, MBA Core)	
2014 Spring	Lecturer, Business Analytics (B6101-001, MBA Core)	
2014 Spring	Lecturer, Business Analytics (B6101-002, MBA Core)	
2014 Spring	Lecturer, Business Analytics (B6101-003, MBA Core)	
2013 Fall	Lecturer, Foundations of Optimization (B9118-001, PhD Core)	
2012 Fall	Lecturer, Foundations of Optimization (B9824-001, PhD Core)	
2012 Spring	Lecturer, Quantitative Finance: Models & Computation (B8835-001, MBA Elective)	
2012 Spring	Lecturer, Quantitative Finance: Models & Computation (B8835-002, MBA Elective)	
2011 Fall	Lecturer, Foundations of Optimization (B9824-001, PhD Core)	
2011 Spring	Lecturer, Security Pricing: Models & Computation (B8835-001, MBA Elective)	
2011 Spring	Lecturer, Security Pricing: Models & Computation (B8835-002, MBA Elective)	
2010 Fall	Lecturer, Foundations of Optimization (B9824-001, PhD Core)	
2010 Spring	Lecturer, Security Pricing: Models & Computation (B8835-001, MBA Elective)	
2010 Spring	Lecturer, Security Pricing: Models & Computation (B8835-002, MBA Elective)	
2009 Fall	Lecturer, Foundations of Optimization (B9824-001, PhD Core)	
2009 Spring	Lecturer, Security Pricing: Models & Computation (B8835-001, MBA Elective)	
2009 Spring	Lecturer, Security Pricing: Models & Computation (B8835-002, MBA Elective)	
2008 Fall	Lecturer, Foundations of Optimization (B9824-001, PhD Core)	
2008 Summer	Lecturer, Decision Models (B6015-002, MBA Core)	
2008 Summer	Lecturer, Decision Models (B6015-003, MBA Core)	
2008 Spring	Lecturer, Security Pricing: Models & Computation (B8835-002, MBA Elective)	

Outside Activities (2015–present)

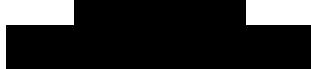
Columbia Business School requires its faculty members to disclose any activities that might present a real or apparent conflict of interest. The list below complies with this requirement.

2021–present	Compass Lexecon Inc <i>Senior Consultant.</i>	Chicago, IL
2014–present	Bourbaki LLC <i>Managing Member.</i>	New York, NY
2020–2021	EverQuote Inc <i>Member, Advisory Board.</i>	Cambridge, MA
2020	TGS Management Company <i>Invited Speaker.</i>	Irvine, CA
2019	UBS Investment Bank <i>Invited Speaker.</i>	New York, NY
2019	Engineers Gate LP <i>Invited Speaker.</i>	New York, NY

Personal

- Male; Citizenship: USA; Year of Birth: 1975

APPENDIX F



2010 to Present Retired, Governors Club Country Club, Chapel Hill, NC, Board of Director

2006 - 2010

Prudential Financial – New York, New York

Global Head of precious metals. Responsible for managing institutional futures clearing, financing and proprietary trading.

1997-2006

Prudential Financial – New York, New York

Senior Vice President responsible for creating and managing derivative products in precious metals and currencies for institutional clients.

1995 – 1997

Dresdner Bank – Metals Group – New York, New York

Dresdner Bank AG – New York Branch

Senior Vice President and Global Head of Precious Metals, responsible for metals trade and finance business for Dresdner Bank AG worldwide, with a global client base comprised of central banks, mining companies, and industrial consumers of metals.

1994 – 1995

Deutsche Bank Sharps Piley, Inc. – New York, New York

Deutsche Bank AG – New York Branch

As President and CEO of both Deutsche Bank, Sharps Pixley, Inc. and Sharps Pixley Bankers Inc., manage the precious metals trade and finance business and the base metals trading and brokerage business of Deutsche Bank AG in New York. Served board customer base, including, central banks, mining companies, jewelry manufacturers, and industrial consumers of metals. Trading products included spot, forward options and proprietary trading on behalf of the firm. Corporate finance products included project finance, financial advisory services, and commodity price risk management.

1976 - 1994

Sharps Pixley Inc. – New York, New York

Kleinwort Benson Ltd.

Joined firm as junior trader upon graduation from university. In 1980, appointed Senior Trader reporting directly to CEO. In 1985, promoted to Executive Vice President. In 1992, appointed by the Board of Directors as President and CEO of both Sharps Pixley, Inc. and Sharps Pixley Brokers Inc. As President, executed business strategy to develop the firm's presence in the corporate market with mining companies in addition to the existing commercial trading and central bank franchise.

Professional Associations

Commodity Exchange Inc. – Served as an elected Governor on the Board of the Exchange and was Vice Chairman from 1992 to 1994, representing the Metal Trade Groups. Also served on the Margin Committee and the Merger Committee responsible for the merger with the New York Mercantile Exchange.

Education

St. Francis College, New York
Bachelor of Arts